

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

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*(continued)*



## Lectures on Practical Mining in Germany.

## CLAUSTHAL MINING SCHOOL NOTES—No. LII.\*

BY J. CLAPK JEFFERSON, A.R.S.M., WH. SC.,  
Certificated Mining Engineer.  
(Formerly Student at the Royal Bergakademie, Clausthal).  
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## SECTION III.

**SACH'S ROCK DRILL.**—This machine is the invention of Carl Sach, machine inspector of the Vieille Montagne Company at Aix-la-Chapelle, and was extensively employed by him at the Altenberg calamine mine, near Aix-la-Chapelle. This machine was invented in 1862, and in 1865 the inventor published a description, with an account of the results obtained in the above mine, from which the following is taken. On a frame formed by two round bars (3.6 centimetres in diameter) and two cross pieces rests a cylinder (10.5 centimetres inside diameter, and 14 centimetres maximum stroke) by means of four lugs cast on the cylinder, and which are bored out to fit the bars, so that the cylinder can be slid to and fro along the bars. Within the cylinder is a thick wrought-iron piston, attached in front to a very thick (6.5 centimetres diameter) piston rod, and at the back to a much smaller one, both passing through corresponding piston glands in the two cylinder covers. The thicker piston rod carries at its front end the borer, which is firmly fixed to it by means of a cotter. The smaller piston rod carries at its back end a traverse or cross piece, which is guided in two grooves cut in the side bars forming the frame of the machine; the end of the piston rod is turned somewhat smaller, and passes through a corresponding hole in the traverse, a nut being screwed on to the extreme end, the whole being arranged in such a manner that the piston rod can rotate without necessitating the rotation of the traverse, which is prevented doing so by means of the grooves in the side bars.

The to and fro motion of the piston is regulated by means of a slide valve. The air is admitted by means of a shut off or regulating cock (to which an india-rubber piping from the air compressor is attached) into what is usually the escape port, and from thence through the inside of the slide valve, according to the position of the latter, either before or behind the piston, whilst the exhaust air escapes into the chest above the slide valve, and, as the chest has no sides, then direct into the air. This arrangement is that of the ordinary locomotive slide valve reversed. The motion of the slide valve itself is effected in the following manner:—To the back cylinder cover is attached a strong wrought iron support, passing downwards, and bent backwards at right angles; through this support an axle passes, to which are fixed two levers, which work in elliptical holes in the traverse before described, so that by the to and fro motion of the piston a rocking motion is imparted to the axle. On this same axle are two shorter levers, passing upwards on both sides of the valve rod, which has a screw cut at its extreme end, on which two nuts pass, being held at a proper distance apart by means of a holder. The two short levers as they rock to and fro strike against the nuts, thus producing the necessary motion of the valve. As the movement of the valve is only required to take place shortly before the end of each stroke, the nuts are screwed on and held in such a position that it is only towards the end of the rocking movement that the short levers come into contact with the nuts. The position of the two nuts can be readily altered, so that the set of the valve can be altered as a stronger or weaker blow is required. The valve itself consists simply of a box of cast-iron, without top or bottom, except that it is divided into two parts by a horizontal plate cast in the centre, through the middle of which a small hole is bored, so as to allow the compressed air entrance to the top side of the valve, which is thus to some extent an equilibrium valve. The valve chest cover is held down by four screws only, and presses but lightly against the valve, so that the motion of the latter is not greatly hindered. As it is during the forward motion of the piston that the work is chiefly done, the front area of the piston is smaller than the back, as we have shown, in consequence of the piston rod which passes through the front cylinder cover being much thicker than that passing through the back cylinder cover, and this is also necessary on account of the front piston rod having to receive the shocks.

In order to produce the gradual rotary motion of the borer between each blow the back piston rod passes airtight through aatchet wheel provided with 33 teeth, and the boss of which fits in the glands of the back cylinder cover, as in a bearing. The piston can in this manner slide to and fro through the ratchet wheel whilst the latter is being rotated, which, by means of a key in the one and a corresponding groove in the other, also communicates the gradual rotary motion of the ratchet wheel to the piston rod and borer. The gradual rotation of the ratchet wheel is effected by means of a catch attached to a small rod, which by means of guides screwed on the back cylinder cover is guided in a vertical up and down motion. The catch is kept pressed against the ratchet wheel by means of a straight spring. The lower end of the rod is loosely attached to a short lever, which sits upon the short axle we have previously mentioned as carrying the levers for causing the motion of the slide valve. A catch held down by a flat spring on the top of the wheel prevents its rotation in an opposite direction. The short lever is so arranged on the axle that during the back stroke (that is as the borer is being withdrawn from the bore hole) an angular rotation of 10° is imparted to the piston, piston rod, and borer, whilst during the forward motion of the piston there is no rotation whatever.

In order to impart a gradual forward motion to the cylinder as the bore hole gets deeper a large lug is cast on the top of the cylinder, in which a nut is inserted. Through this nut a long screw passes, the end of which rests in the cross pieces of the frame. At the back end the screw is provided with a handle, by means of which the attendant can turn the screw. All the nuts and cotters on the machine are held with split pins, to prevent their shaking loose with the vibrations to which the whole is subjected. The entrance of the steam passages into the cylinder are placed at a short distance from each end of the cylinder, so that there is always a cushion of compressed air between the piston and cylinder cover. The machine is designed for working with a pressure of 15 lb. to the square inch.

The carriage to which the boring drill was attached consisted of two (4.02 metres) long horizontal beams, attached to two axles, on the ends of which four small wheels were fixed, so that the frame could be run along rails in the levels. The beams which pass beneath the axles are held stiffly the proper distance apart by means of four long cross bolts. On each beam four vertical iron standards are fixed, and properly tied and strutted together. The front part of the carriage is designed to receive the machines, and overhangs somewhat the first pair of wheels; the back part serves to hold a water-tank, reserve machines, india-rubber piping, tools, &c. The carriage reaches to nearly the whole height of the level, and in the small space left between the top of the frame and the roof of the level wedges are inserted to keep the machine tightly fixed.

The four forward frames are made of cast iron, and have toothed or rack edges. The two foremost of these receive a grooved cross bar, the second or back two receive a round cross bar. These two cross pieces can be placed in any part of the rack standards, the flat grooved cross bar being made fast with wedges, and the round cross bar by means of a pair of cotters. By means of a nut and a bolt passing through the slit in the flat cross bar, a double forked arrangement can be securely fixed in any part of the cross bar. The front ends of the two round bars forming the frame of the drilling machine rests on the two forks in this arrangement. On the round back cross piece is fixed the moveable connecting head, which is attached by means of a pin to the hindmost cross piece of the frame of the machine, and held fast by means of a

cotter. The cross piece, the pin, and a strong vertical bolt in the connecting head from three axes at right angles to each other, by means of which the bore machine can be placed in any direction or inclination.

When it is required to raise or lower the machine the two cross bars are taken out from the standards, and placed higher or lower. If necessary the connecting head is loosened, so that the machine and the two cross pieces can be separated and handled separately, which is necessary owing to the great weight of the whole, and this loosening and fixing of the machine occupies some time. The two cross pieces project some distance sideways beyond the standards towards the sides of the level against which they are wedged tight with wooden wedges.

Into a closed reservoir or tank, which is placed on the back part of the carriage, water is introduced, which is used for washing out bore holes, the water being forced along the india-rubber piping by means of the pressure of the compressed air.

In executing the boring operations the frame is first brought forward to the end of the face, and wedged fast against the roof and rails. Afterwards the place where it is intended to commence drilling the bore hole is chipped smooth with the hand, and the two workmen place the machine in position on the carriage, and fix it tight; the shortest borer is then inserted, and by means of the screw handle the cylinder moved so far forward that the borer, when the piston is nearly at the end of the forward stroke comes in contact with the rock. The compressed air is then gradually admitted, and afterwards, when everything is found to be all right, the cock is turned full on, the number of blows increasing from 200 to 400 per minute. When the borer becomes blunt, or the hole is bored to a depth equal to the length of the borer, the cylinder is drawn back by rotating the long screw, and a longer borer is inserted. As soon as the ordinary or required number of holes are bored the wedges holding the carriage tight are loosened, and the carriage is withdrawn, the holes are charged and fired, and the loosened mass is removed, the place cleared, and the machine is again moved forward to commence afresh.

The machine, which without the connecting head and borer weighs 185 lbs., and with these 225 lbs., is too heavy to be readily handled, and has besides the disadvantage that the gradual forward motion of the borer as the hole gets deeper is not self-acting, and that one cannot bore in the floor of the level with it. In order to remedy these evils, Sach designed and constructed a second machine, to work at a pressure of two atmospheres. The general disposition of the machine is the same as in the preceding one, the motion of the valve and the rotation of the borer being effected by exactly the same mechanism as before, only there is an additional self-feeding arrangement for the gradual forward motion of the cylinder as the borer penetrates into the rock. For this purpose a second ratchet wheel is placed between the back cylinder cover and the ratchet wheel for effecting the rotation of the borer, the number of teeth being such that the ratchet moves the wheel through the space of one tooth whenever the piston makes a maximum stroke; if, however, the piston does not come pretty nearly to the end of the cylinder the ratchet wheel remains stationary—i.e. the stroke of the lever actuating the ratchet is not sufficiently long to allow the catch to drop down and catch the straight edge of the tooth, but simply slides on the curved surface of the tooth. The catch for the ratchet wheel is actuated in exactly the same way as we have seen for the other—by means of levers. To the ratchet wheel a pinion is attached, which latter gears into a second, which forms a nut. This nut embraces one of the two round bars which form the frame of the machine, and which for this purpose has a strong screw thread cut upon it. Part of the boss of the wheel, which forms the nut, fits into one of the four lugs cast on the cylinder, and in which it can rotate. When the nut is rotated (which takes place whenever the piston makes a full stroke) the machine is moved forward; when, however, the stroke of the piston is short no rotation of the nut takes place, and the cylinder remains stationary. The cylinder can be moved back by hand by means of a number of small handles fixed radially at the front end of the nut, or by means of a hand ratchet brace made to fit the pinion.

This machine is much lighter and more compact than the other, and weighs only 93½ lbs. The machine with a pressure of from 20 to 23 lbs. per square inch made from 500 to 600 blows per minute with great regularity. The machine bored in hard dolomite at the rate of 1 inch per minute, the changing of the borer, &c., included, the breadth of the cutter being 1½ inches. The mode of fastening the machine to the carriage has also been simplified. The forked rest for the front of the machine is so arranged and provided with screws, &c., that it can be raised or lowered on either side alone, and can also rotate about a central pin as in the former arrangement. By these means the rest can be placed in any position most suitable for the machine.

The attachment at the back to the cross bar was made simpler and lighter. An hinge piece, which is capable of rotation about the round cross bar, can be, by means of the screw bolt and a nut, fastened in any position. The upper end of the bolt forms an eye, through which a second cross bolt passes, so that in this simpler manner there are three axes at right angles to each other, and the machine can thus more readily be placed in any desired position. The larger machine was employed at the Altenberg Mine for the purpose of driving a level between the principal shaft and the calamine deposit at a depth of 100 yards. The length of the level was 423 ft., the height 7 ft. 6 in., and the width 7 ft. 6 in. The cylinder was 4 inches in diameter, had a maximum stroke of 5½ inches, the number of blows averaging between 300 and 400 per minute.

The borer, the cutting edges of which were Z-shaped, varied in length between 18 inches and 4 feet, and the breadth between 1½ and 1 inch. The arrangements for boring with the machines were commenced in 1862, but in consequence of various obstacles the machines were not got to work before the beginning of March, 1864, when 200 ft. had already been driven by hand; the remaining 230 feet were, however, completed in August the same year. The following gives a comparison of the hand and machine work in the driving of the adit.

Date—1863.	Length completed in the month in feet.		Wages paid per foot advance.	
	Hand.	Machine.	Hand.	Machine.
Jan. ...	23 ft. 0 in.	—	£6 16 0	—
Feb. ...	12 0	—	2 19 0	—
March ...	13 4	—	2 8 6	—
April ...	10 10	—	2 10 0	—
May ...	4 2	—	2 10 0	—
June ...	15 0	—	2 10 0	—
July ...	15 0	—	2 10 0	—
August ...	10 10	—	2 10 0	—
Sep. ...	16 8	—	2 10 0	—
Oct. ...	18 4	—	2 10 0	—
Nov. ...	18 4	—	2 10 0	—
Dec. ...	17 6	—	2 16 6	—
1864.				
Jan. ...	10 10	—	3 2 6	—
Feb. ...	9 2	—	4 6 2	—
March ...	—	14 ft. 2 in.	—	£3 2 6
April ...	—	30 0	—	2 0 0
May ...	—	30 0	—	1 17 6
June ...	—	41 8	—	1 17 6
July ...	—	50 0	—	1 16 0
August ...	—	62 6	—	1 4 0

**MANUFACTURE OF COKE FROM SMALL COAL.**—The invention of Messrs. HAY and LONGLEY, of Barnsley, is to utilise small coal or smudge by converting it into coke of merchantable quality. They first reduce the small coal or smudge to a pulverised or finely divided state by first grinding it under a pair of rollers or other suitable machinery in a pan, the grinding being more quickly and preferably effected with the addition of sufficient water to bring the mass to a semi-fluid consistency—that is to say, about three gallons of water, more or less, preferably hot, to each hundredweight of smudge or small coal; or the latter might be ground dry and the water added afterwards, but they have not found this answer so well. The pan

in which the matters are ground may be perforated with small holes in the bottom for the ground contents to pass out through if desired. The particles of the semi-fluid mass are then still further comminuted by passing through one or more pairs of rollers set close together. The semi-liquid mass is then poured into the top of a coke oven, of which the door has been built up after the oven has been emptied of the coke resulting from a previous operation. The mass is now subjected to a steaming, drying, and burning process in the oven, by which it undergoes a change, and is converted into coke, a very large quantity of the noxious gases being carried off. The resulting coke is small and long, and of a light yet hard and brittle character. By this process an increase in value of about 80 per cent. is realised.

## EXHIBITION OF THE CORNWALL MINING INSTITUTE.

Cornishmen are almost proverbially rather slow to move, and in mining matters more especially have the credit of being particularly conservative. And it certainly is a fact that they are rather behindhand in the adoption of improvements—witness the difficulty with which the boring machine has won its way into the county. But we take it that this does not arise so much from an obstinate preference for old-fashioned ways, and an equally obstinate objection to turn into new paths. Cornishmen have something to be proud of in the fact that their county produces the best practical miners in the world, and that it has given birth to inventors and engineers of the first eminence—Trevethick, for example, whose son and biographer so recently died. But there is something more than mere pride and conceit in the county habit of making a dislike to get rid of the bird in the hand before there is a very good prospect indeed of catching the two in the bush. They know when they are well served, and care very little about change for its own sake. It would be a good thing if in some other parts of the country we saw a little more of the same stability. However, this by the way. And, on the other hand, if they are slow to start, Cornishmen when they take a thing up as a rule do it heartily. Once convince them of the propriety of a certain course and there is not likely to be much hanging back thereafter. Whatever they undertake to do they do well.

The Cornwall Mining Institute was a long while in incubation; true to their instincts the mining men were very slow at first in taking it up, but now it has been taken up it is making steady progress, and is likely to develop its utilities in directions which were not at first anticipated. As a rule, its discussions have not only been interesting and well sustained, but what is more to the point, of great practical value. There has been a frank interchange of opinions, a plain straightforward statement of facts, a hardheaded contest of views and ideas that must have a very important influence in the elimination of prejudices, and the spreading of information; and besides this, it is something to have got a large body of gentlemen practically interested in mining in all its departments to take anything in the shape of united action. Want of unity has been the great shortcoming of the mining interest. "One and All" has been talked about a great deal, but has had very little actuating influence. And this week the Mining Institute has entered on a fresh field of labour by holding its first exhibition. We do not at all see that this will in any way interfere with the work which the Polytechnic Society has now so well discharged for nearly half a century. The spheres of operation overlap, but there need be no clashing, and indeed there is ample room for both. We have already noted the fact that the Cornish are an inventive race. We could point in proof of this to every department of mining enterprise in which machinery is employed, for there is not a single piece of mechanism in common use in the mining districts that did not either originate there or take its present shape there. And as there is by no means any finality in mining invention, but, on the contrary, improvements are constantly making their appearance all over the county, so an exhibition like this where new inventions and modifications can be brought under the severest practical judgment must do immense good. Every approach towards greater perfection in our mining machinery and plant means greater economy of time, money, and labour, and a more adequate return for each.

The members of the Mining Institute are to be heartily congratulated on their first exhibition, which opened on Thursday and continued during the following day. It was held in the Assembly Rooms, Camborne, and was very much larger than, from a first venture of the kind, might fairly have been anticipated. The ground floor was devoted to the mechanical department, and in the upper room there was a large miscellaneous collection of articles, including pictures, minerals, scientific instruments, &c., while another room was devoted to microscopes, among the chief "objects" shown being some beautifully prepared rock sections. The chief burden of the preparation fell, of course, upon Mr. Provis, the secretary, but he had the assistance of a number of sub-committees, to whom the management of the various departments was intrusted, and the members of which unmistakably worked with a will.

Perhaps the foremost place just now, in dealing with mining machinery, is due to boring apparatus, though there is no special reason for dealing at length with the exhibits in this section at Camborne on the ground of novelty. Messrs. Loam and Son exhibited the Barrow, now in use at Dolcoath and South Crofty; Messrs. Le Gros, Mayne, Leaver, and Co., the Ingersoll; Messrs. Salmon Barnes and Co., had the Roanhead rock-drill; and Messrs. Brydon and Davidson sent one on an adjustable tripod stand. It is not a question now, however, as to the practicability of machine-boring. That has been sufficiently proved, and what is now required is a fair comparative test of the merits all round of the various machines. Of their merits no opinion can be formed from the exhibition of the drills in a room, nor does the mere ordinary working test supply all that is needed. Take the case of the rival borers now at work in the county—the Barrow and the Beaumont. There are really no means whereby their relative merits can be judged by mining men generally, nor will there be until we have all the elements of original cost, maintenance, and working set forth side by side with the work actually accomplished.

In the matter of stamps there was a novelty. The pneumatic stamps are well known, and have done and are doing excellent work, though the *vis inertia* that they have had to encounter has been very great. Mr. S. H. F. Cox, however, exhibited a working model of a double-cam stamping machine, adapted for using Harris and Rounsell's patent annular stamp-head. This stamp-head may be described as a thick heavy ring of iron, which has four lifting-rods. It works in a circular coffer, and the stuff is fed in the centre of the head. Now, Mr. Cox's arrangement is exceedingly ingenious. By a head of ratchet motions, which cannot readily be explained without a diagram, he has arranged a perfectly certain automatic feed adjusted to the rate at which the stuff is stamped, and there is a bell which gives warning when the coffer is empty, should anything go wrong. It is impossible to deny to this machine the credit of great ingenuity; but when all is said and done we have simply a gravitation stamp, and it is more than doubtful whether it is worth while to arrange machinery of such a complicated character for that purpose. If stamps machinery is to be complicated it should be in the direction of something that will pay for that complication by its results, and this can only be found in the direct application of power. At present power, as distinct from gravitation, has not been applied in any better form than in the pneumatic stamps of Mr. Husband. Messrs. Harris and Rounsell, by the way, have an adaptation of the head to ordinary stamps.

Mr. Shall exhibits drawings of his Pneumatic stamps, which have worked, as our readers know, with satisfactory results. Bubbles have of late attracted a great deal of attention, and deservedly, for the part they have to play in the dressing operations is of the highest importance. There were three forms of bubbles shown at Camborne, of course in model. A large model of the large centre-head bubble in use at Carn Breu, to take the stuff direct from the stamps, was shown by Capt. Teague. This, however, does not call for special description. The other two do. They were the Borlase bubble, as used at Pedn-an-drea, and the bubble of Captain Williams, used at Wheal Eliza, concerning which there has been

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath, Dr. VOX GROSSECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.



small holes. If it is further rollers on the top of the even base. The process is carried off, hard and of about

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with mining no special section at and S in exty; Messrs. Salmon, Brydon. It is not a ine-boring, quired is a various ma the exhibi working rival burea on. There is judged by all the elect side by pneumatic g excellent ounter has a working ing Harris head may our lifting the centre ingenious, ained with- matic feed ere is a bell and anything e credit of e simply a it is worth at for that ould be in lication by plication of, has not stamps of y, have an which have

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such a lively discussion. No two buddles could well be more dissimilar in their character, as was well observed by a shrewd observer—one is practically "all head," and the other "no head." Mr. Borlase's buddle is really four buddles arranged in annular pairs—concave and convex, one pair above the other. Thus the waste which passes from the inner convex buddle above falls on the inner concave buddle below, and that which falls from the outer concave buddle above on the outer convex buddle below. The feeds and work-offs are arranged with great ingenuity, and it is quite certain that with this buddle very excellent work has been done, and that the waste may be regarded as really useless.

Now, the buddle of Capt. Williams is quite the reverse of all this. It is a simple convex buddle, into which the stuff is discharged at the very centre, which has nothing on the flow of the buddle except a couple of long brushes sweeping round, and which discharges by a couple of apertures in the side of the buddle, one opposite the other. In fact, looking at the utter simplicity of this arrangement, one does not wonder that it should have been considered a very old idea indeed. The care taken of the feed arrangement is, however, decidedly not old. The stuff is delivered from the stamps launder into a revolving sieve or riddle, with a fine mesh, and only that which can pass through the mesh finds its way to the buddle. In the sieve the stuff is subjected to the action of a stream of clean water. The stuff which is too large to go through the mesh passes on to a grating, where it is swept out for re-stamping, &c., by a brush on the main axle; and we have Capt. Williams's authority for stating that this buddle also does excellent work. Would it not be possible to arrange that a competitive trial should take place, and that both these buddles, with others that may be thought peculiarly efficient, should be tried on the same class and quantity of stuff for the same period?

An exceedingly interesting model in section of the skip-roads at Carn Brea was shown by Capt. Teague, jun. It showed the arrangement of the pitwork, and of the manner in which winding in three shafts is carried on from one point. Where formerly a water-wheel was used underground at a considerable expense—upwards of 20 tons of coal per month—the hauling is now done direct from the surface; the skip-roads, from a downright and an underlie shaft, being brought up together. As a matter of practical mining engineering the model was of peculiar interest, and even more so was a supplementary model, showing what the difficulties in the shaft were, with its turns and its angles, and how admirably they have been got over. It was at one time deemed an impossibility to put a skip-road in such a shaft as the one under review.

Capt. Teague likewise exhibited a very simple form of apparatus for tossing and packing in use at Carn Brea. The arms of the tosser are worked by gearing, and when the tossing is over the arms are withdrawn from the kieve, the tosser wheels thrown out of gear, and the packing iron released. This is driven by a double cam on the main axle, with the least possible expenditure of power.

Messrs. Dingey, of Truro, exhibited a working model of an improved winding gear and tip wagon. This is a point to which they have paid considerable attention, and with excellent results. Capt. Hodges, of Wheal Grenville, showed a self-acting jigger of a useful type, but which could hardly be said to present any novel features; in fact, the difficulty now a days would be to find any form of jiggering apparatus that was absolutely new. Although new arrangements and applications have been introduced the Germans seem to have pretty well exhausted all the possible principles.

Mr. Holman, of Camborne, exhibited among other matters a Morris power horizontal engine, and Mr. Muller, of Birmingham, the "Alpha" gas making apparatus, which makes gas of gasoline. A very attractive case containing samples of all their makes in patent fuses, &c., came from the factory of Messrs. Bickford, Smith, and Co., at Tuckingmill.

Huddell's Steel Foundry Company (Sheffield) made a large and attractive display of their crucible cast-steel castings, which stand a tensile strain of nearly 40 tons per square inch, and of their self-oiling steel wheels, which contain cavities by the side of the wheel for the reception of liquid grease.

Mr. Marsden, of Leeds, showed one of his powerful hand rock crushers, and Mr. Provis also had a model of the patent reversible cubing jaw, which has added so much to the power and efficiency of these machines.

Among the models special attention was attracted, and deservedly, by the original model of the Dolcoath man-engine, made in 1834 by the late Mr. Loam, as interesting a relic in its way as one of the Watt models shown in the scientific collection at South Kensington.

Then Mr. Tangye, of Illogan, exhibited various chucks and tools; Messrs. Williams, Helston, a model of an automatic feed for an ore pulveriser; Mr. Copeland, Crowan, models of safety cartridges; Mr. Humble, Uxoteter, a model of King's safety detaching hook; and Mr. Morrison, Manchester, a model of a new air compressor. There were also various smaller matters of less note.

The instrument department deserves special mention. Mr. Gregory, of London, exhibited through Mr. Rudson Read a capital series of his collections of rocks and minerals, geological picks and hammers, blowpipe cases and requisites. Messrs. Statham sent their various chemical cabinets; and Mr. Fletcher, of Warrington, the latest forms of his gas furnaces and blowpipes. The mechanical blowpipes are exceedingly ingenious, from the little hand one up to those which are capable of melting the most refractory metals in crucibles—called blowpipes, but really miniature blast-furnaces. There is one form which is particularly good, and which allows of a considerable quantity of gold or silver being melted by either hot or cold blast in a plumbago pan, the heat being derived from a Bunsen burner flame driven upon the assay by the blast (hot or cold at pleasure). When the melting is complete the tilting of the apparatus runs the metal into a mould, which forms part of the arrangement. Another form of blowpipe is really a tiny muffle-furnace, the blast being directed against the bottom of the little crucible snugly enclosed in its diminutive muffle.

Mr. A. Jeffery, of Camborne, was represented by a large collection of miners' dials and other instruments of all kinds adapted for mining purposes, beautifully made and finished. Unfortunately he had not been able to complete a new form of dial which he had in hand in time for the exhibition. This arrangement was shown at the Polytechnic Exhibition in 1876 by Mr. J. T. Letcher, and has been pronounced by no less an authority than Mr. Henderson to be a very great improvement, but the "best of any I have used or seen." The quadrant is a far superior arrangement to that hitherto used for taking vertical angles, and the face of the dial being never obscured the bearings can be read under any circumstances with the greatest ease. It is a pity that Mr. Jeffery was unable to introduce it at this exhibition.

Mr. Newton, of Camborne, likewise had a large collection of dials and other instruments of his well-known and approved makes.

collections of minerals, &c. The chief matters Commended were Holman's horizontal engine, Sholl's model pneumatic stamps, Dingey's winding gear, Williams's pulveriser-automatic feed, the St. Day Fire-Brick Company's bricks, Capt. Teague's models of buddles, packer, &c., and some engine models. The decision of the judges concerning the drills and one or two other matters was not given in time for our present issue.

#### COAL, AND ITS USES.

An exhaustive and interesting lecture on "The Formation of Coal, and the Purposes to which it can be applied" was delivered on Monday evening at the Bristol Mining School by Mr. HANDEL COSSHAM, the well-known coalmaster, and listened to with marked attention throughout. The chair was occupied by the Mayor (Mr. G. W. Edwards), who remarked that the lecture inaugurated the second course that had been given to the students since the school had been under the management of the present governing body, and he only trusted the course would be as successful as the previous one. He offered a high compliment to Mr. Cossam for his lecture last year, and also for the services he had rendered to the school both before and since it had been in the hands of the present governing body, and especially for his having opened his collieries to the members of the Mining School for the purpose of practical study, and also for the practice of surveying. The lecture was then proceeded with, Mr. Cossam remarking that although they were no doubt perfectly familiar with the fact that coal is a mineral of vegetable origin, but that although this fact is so familiar to us, it is worth noting that no longer ago than 1785, when Dr. Hutton first proclaimed this truth to the world, he was greatly laughed at and ridiculed, and it was not till the present century was somewhat advanced that this fact became one of the admitted and recognised truths of science, notwithstanding it can be proved to demonstration by several facts. First by the chemical and combustible properties of coal which contains all the elements of vegetable life and structure; only, so far as carbon is concerned, in a more concentrated form than is found in trees and plants. For instance, green wood, peat, which is intermediate between wood and coal, and good steam coal will contain:—

	Carb.	Hydr.	Nit & Ox.	Ash	Water.
Green Wood	40	2	6	2	50 = 100
Peat	45	2	10	10	30 = 100
Steam Coal	90	3	8	3	3 = 100

Thus the constituents of coal, wood, and peat differ only in the proportion in which the different elements are combined. The microscope has also enabled the vegetable origin of coal to be demonstrated from the structure of coal itself. The associated strata are full of evidences of a past flora, rich beyond anything the world has witnessed before or since. The most luxuriant tropical climate of our globe only faintly approaches the luxuriance and grand vegetable growth of the coal period. Another striking proof of the vegetable origin of coal is to be found in the underlying strata of our coal beds—the marvellous development of rootlets that are found in the underlying fire-clays of the coal seams. For a long time these root formations greatly puzzled geologists, until Sir W. Logan and Mr. Binney showed them attached to the stems of the trees they sustained, and thus completely settled their relation to the plants of the coal beds above. Coal plants have been brought from Melville Island in latitude 76°; from Albertland, in the Western atmosphere, in latitude 78°; and from Spitzbergen in latitude 77°, in the Eastern hemisphere, where no vegetation will now grow. It is clear that while much has been learnt relative to the vegetable origin and structure of coal, much more has yet to be done before we can solve many of the problems that face us on the very threshold of the enquiry. One thing, however, may be taken as proven—that coal is of vegetable origin.

The study of the vegetable origin of coal naturally leads up to the fact that although the greater part of the plants that have been discovered in the coal formation belong to the lower types of vegetable life, such as ferns. There are also to be found in that formation a considerable number of coniferous plants; so that, as Sir Charles Lyell remarks, their presence precludes us from characterising the carboniferous flora as consisting of imperfectly developed plants, the coniferal taking a high, though not the highest, position in the ranks of vegetable organisms. Mr. Nicoll, of Edinburgh, thinks that the *Pinus auracaria* of our tropical forests best represent the fossil flora of the coal period, and probably some of the great swamps near the Mississippi best represent the appearance of the earth during that age. Hence there is not the least confirmation of the development theory in the carboniferous period. What a strange world it must have been then! The sun must then, as now, have shown down warmly upon the tropical vegetation of the period. What dense luxuriance of foliage must have overspread the great lagoons of the carboniferous age; and yet, so far as we can judge, what loneliness and silence must have prevailed.

In Great Britain there are six exposed coal fields—the Great South Wales basin, Forest of Dean, Burnley, Ayrshire, Clyde, and Midlothian, and there are also six concealed, or partly concealed, coal-fields—the Bristol and Somerset, Midland, South Lancashire and Cheshire, Yorkshire, Derbyshire, and Nottinghamshire, Northumberland and Durham, and Cumberland. It is worth noting, he remarks, that while all these coal fields are now found in the basin form, yet they were not originally deposited in that form—the carboniferous strata probably covered, or nearly covered, the whole island originally. Having explained the formation of coal, and some of the changes subsequent to that formation, he next called attention to the coal resources of our island and of the world. That a vast amount of the coal of the world is concealed and unknown Mr. Cossam thinks is undoubtedly true. When we recollect how marvellously every investigation of the resources of our own island has tended to remove our fear as to the probable exhaustion of our coal supply, he thinks it is not presuming too much to ask the belief that further investigation and enquiry will probably increase the estimate now made as to the quantity of available coal yet to be worked in Great Britain. The present estimate is that in Great Britain we have 140,000,000 tons of coal yet to work, which, at our present rate of consumption of 135,000,000 tons per annum, will last 1000 years. This calculation is based on the hypothesis that we can only work coal to the depth of 4000 ft., but he is far from assenting to that opinion.

The output of the world for the present year will be about 250,000,000 tons, more than one-half of which is raised in Great Britain. Dr. Siemens estimates the present known coal area of the world to be 270,000 square miles, but he thinks this is very much under the mark, inasmuch as the United States of America alone is supposed to possess 150,000 square miles of coal field. Mr. Cossam also gives figures showing in what branches of industry the coal is consumed, and how much is used by each, and then very truly remarks that these facts not only show how greatly the coal trade now depends on the manufacturing interest, and especially on the manufacture of iron for its prosperity, but it also gives us an opportunity of seeing the reason why there has been such violent fluctuations in the coal trade of late years. It is said that in 1836 the iron trade of this country took less than 4,000,000 tons of fuel, while it now takes about 35,000,000, or 3,000,000 more than the total output of 1845. And here he draws another moral from the facts named, and which he hopes will receive the attention of the workers in our mining industry. He sees that some of those who call themselves the leaders of our colliery population are counselling a restricted output as the solution of the present depression in the coal trade, and the consequent reduction in wages at the collieries. He takes such counsels to be utterly unpatriotic, and contends that they can only end in disaster. For any man to restrict his labour in any colliery in which he is engaged is unjust to himself, his family, and the nation at large. If he thinks he can use his labour in any other calling in life with more advantage to himself and family well and good; he not only has a right to do so, but it is a duty he owes to himself and those dependent upon him so to employ it. But while engaged in any industry let him honestly work to the best of his ability and strength, so as to attain the best results for his employer and himself.

Any artificial restriction of labour can only have the effect of in-

creasing the cost of the article on which the labour is being employed, and thus preventing the development of the trade on which our national prosperity so largely depends. Let me ask, he continues, those who give this unwise and criminal advice to consider what would be the effect of the general adoption of their views? Suppose those who work on our food supply try to restrict our labour so as to make our food as dear as they can, would it not be unjust to the consumers of the country? And as our tolling millions are the greatest consumers they would, of course, be the greatest sufferers by the adoption of such a policy. Mr. Cossam takes it to be the duty of coalowners and coal workers to raise their coal as cheaply and in as good condition as they can, and with the least possible sacrifice to life or health, and at the same time to realise the best price the market will afford, and pay the best wages the price realised will allow, and he would add that the coalowners should make the best profits they could for themselves.

Mr. Cossam then referred to the expansion of the iron trade as bearing upon the consumption of coal, the production of illuminating gas, the use of coal on railways, for steam navigation, and to Perkins' discovery of the coal tar colours. The lecture contains an enormous amount of information, and likewise raised several very important questions in connection with the working of coal, and the relation of coalowners and working miners, which are so worthy of general attention that an opportunity will be taken to comment upon them in future Journals.

#### INTERESTING EXPERIMENTS WITH DYNAMITE

A number of gentlemen were invited to the Foreest Limestone Quarries, near Darlington, on Thursday, to witness a series of experiments to show the capabilities of dynamite as an explosive for blasting purposes, fired by means of electricity, and also by fuse in the ordinary way. Amongst those present were—Mr. J. E. McNay; Mr. George Stephenson, general manager of the Stockton and Darlington Section of the North-Eastern Railway; Mr. Wm. Smith, mineral traffic manager; Mr. Wm. Cadworth, engineer; Mr. Graham, locomotive department; Mr. T. Richardson, secretary of the Foreest Limestone Company; Mr. Abbott, manager of the quarries; Mr. Colling, assistant manager; Mr. A. R. Mitchell, Foreest Hall; Mr. A. C. Downey, Mr. John Marley, Mr. J. C. L'Anson, Mr. Wharton Watson, and Mr. J. Muirhead Armstrong, of L'Anson, Armstrong, and Co., Middlesborough, agent for the Cleveland district for Nobel's Explosives Company (Limited). After reaching the quarry the party proceeded to view the experiments. The first one was made on the top step or bench of rock in the quarry, into which nine holes had been bored in line, extending over a length of about 60 ft., by 6 ft. wide. These holes were loaded with dynamite, and Brain's electric fuses inserted, coupled up to each other by small copper wires insulated with gutta-percha, joined on to two main cables leading to a high tension frictional electric machine a safe distance away. All being ready, and the signal for firing given, the machine was unlocked, the cables attached to the terminals (completing an electric circuit), and by turning the handle of the machine an electric spark was dispatched along the cable through the charges, which exploded simultaneously. As the result the whole section of rock operated on was completely torn up in a most satisfactory and astonishing manner. On further examination it was found that the rock was loosened a considerable distance below the bottom of the holes; in some instances to the next bed, 3 ft. under.

The next experiment was on the top of the main heading of the quarry. Six holes were charged with dynamite, and an ordinary Bickford fuse, with a detonator attached, was used for exploding. These charges were fired in detail, each working very satisfactorily, the quarrymen being much pleased, as it cracked the stone very considerably, enabling them to break it up much more easily than when blasted with gunpowder, and thereby effecting a material saving of labour.

A single bore-hole, about 4 ft. 6 in. deep, was then loaded with dynamite as against gunpowder, and fired in the ordinary way, the result being that the rock was well broken, and toppled over into the bottom of the quarry.

Another experiment took place in the new quarry, situated about a quarter of a mile from the other, and it having been intimated to the quarrymen that dynamite was to be used, they bored the holes in such positions as to have much more rock to operate on than they would otherwise have had if gunpowder or any other explosive was to be used. The rock in this quarry is of a very strong and solid nature. Six holes were loaded in the main narrow heading, and exploded in the ordinary way. On examination it was found that all had operated well, one shot in particular having cut the rock in the upper bench clean across the heading, a distance of about 18 to 20 ft. Five holes, ranging from 2 ft. to 4 ft. 6 in., were then loaded, and discharged in another part of the quarry, operating most efficaciously.

A large ash tree in an adjoining field was then operated on. The tree had tusk roots 15 in. diameter running into the ground, and into these bore-holes were made and loaded with dynamite. A portion was also placed near the centre root of the tree. Electric fuses were inserted in the charges in the usual way, and the whole exploded simultaneously by electricity, the result being that the large roots with the bore-holes in them were torn completely off, a portion of the tree was blown a considerable distance away, and roots and debris were blown in every direction, leaving the tree a complete wreck. All the experiments were conducted by Mr. John Harris, one of the Dynamite Company's experienced instructors, and his assistant, and the superiority of dynamite over gunpowder and other explosives as to safety, economy, and strength was clearly demonstrated by the immense displacement and breaking up of the stone. It was also practically proved that dynamite requires a strong percussion cap to explode it, and that when set fire to in any other manner it merely burns harmlessly away. The gentlemen afterwards adjourned to an excellent repast, and eventually returned to Darlington and Middlesborough much pleased with the day's experiments, and with the kindness and hospitality evinced by the directors of the Foreest Limestone Company.

PROSPECTS AND POLICY OF INVESTORS.—A work on this subject, brief and condensed, has been published by Mr. J. B. REYNOLDS, Ethelburga House, City, which deserves the attention of the public. It is replete with shrewd and thoughtful observations and pertinent facts connected with the commercial and financial situation. Mr. Reynolds takes a hopeful view of things. He is of opinion that the prospects of investors, great and small, are brighter than they have been for a long time. This he attributes to the cheapness of money which has ruled for so protracted a period, and now, although the official minimum is 5 per cent., the open market is lower, and 5 per cent. is not too dear for money for trade purposes, and those of reasonable venture in speculative business. Mr. Reynolds thinks also that as there is now a recognised law of commercial affairs that stagnation is followed by powerful reaction—the former has now exhausted itself, and the latter is just opening upon us. He is of opinion that men of business, whose inactivity in recent years has been enforced, are now returning to their pursuits with invigorated spirit. "Periods of depression do infinitely more good than we sometimes imagine; they afford rest, and also time for recognising great mistakes, and calculating future contingencies. Out of seasons of commercial depression business men emerge wiser and better." This interesting brochure offers reasons for the conclusion that the Eastern War must soon terminate, and the thoughts and expectations of capitals be freed from the timidity which prevailed. Confidence in our political institutions, amidst so much confusion in other countries, he also thinks is conducive to restored action. As to the policy which investors should pursue, the publication urges the greatest caution of foreign loans, mines, railways, waterworks, gasworks, &c., by all of which the British public have lost much money; and it is recommended that home investments, which are in most cases sound and remunerative, should be studied and sought. Among these, mines have the first place, because they have been most profitable of any; the value of a mining property is ascertainable, all the operations are visible, and the investor can look after his own affairs. There may be bubble mining companies as well as bubble banks, rotten ships, reckless financing, and fictitious trade transactions, and the credulous and a fooling may be taken in. But while the ships may founder far away, the goods sent by traders to a distance glut the markets, banks lend to borrowers whose solvent seeming is deceptive, the mine is there, and stays there. The investor who sees for himself what metal it yields, and if he consults a competent and honest dealer, or agent, he may receive all the information he requires as a guarantee for the safe employment of his capital. Our author strongly insists upon the impolicy in all times of putting with mining shares under the influence of despondency. Men seldom reason under the influence of panic. Those at such conjunctures who hurriedly part with their shares at any price in their alarm, find as the wheel revolves the same shares to be worth more than they gave for them in a rising market. The writer shows that there is now a stronger disposition to hold and to buy mining property. He reviews the course of the trade in tin and other metals for some years, and proceeds to answer the question, "What should be bought at this moment?" The policy he points out is thus expressed, "Fix upon a first-class



metalliferous district. Let us seek a property about the success of which there can be little doubt; let us make sure that it has been inspected by a geologist beyond suspicion, and of well known scientific reputation; let us be satisfied as to the constitution of the concern, and also of the character of the parties connected with it. The outsider must in a great measure be guided by his professional advice concerning these points, but he can easily put to the test the accuracy of the information given." This is the true policy for an investor in mining property to pursue. The opinions imparted on the subject are clear, succinct, and trenchant.

### Meetings of Public Companies.

#### SILVER PLUME MINING COMPANY.

The annual meeting of shareholders was held at the offices of the company, Great Winchester-street, on Wednesday.  
Mr. WILLIAM WADHAM in the chair.  
Mr. T. ORCHARD (the secretary) read the notice convening the meeting.

The CHAIRMAN said the meeting was the annual meeting of the company, held in accordance with the law. The shareholders had been called together that they may see the balance-sheet made up to December last, and that they might also hear the account the directors could give them with respect to the mine. It was not a very satisfactory one, but such as it was they would have all the information which it was in the power of the directors to give them. He would ask Mr. Orchard to read a statement of what had taken place since the last meeting.

The last general meeting of shareholders was held on Nov. 29. The lawsuit between the company and the vendors has been put off from time to time through various causes. It was to have been heard at the last term of Court in December last, but owing to the change in Colorado from a Territorial to a State Government, there were appointed new judges, and the terms of Court were altered to May and October. In May last they were disappointed by receiving information from the company's agent, Mr. E. Le Neve Foster, that our case would not be heard that term on account of an epidemic prevailing in the village of Silver Plume, and strict quarantine was established between it and Georgetown, where the Court was sitting. At the same time he informed us that it was the intention of the attorney for the vendors to have the case removed from the district Court to the United States Circuit Court. This, we are informed, they succeeded in doing, and it was put down to be heard next month. Most unexpectedly, however, we have the satisfaction to inform you that by the last advice received from our agent we are informed that he has succeeded in bringing our suits to a satisfactory issue, and that all suits against the company commenced by the vendors have been dismissed at their own costs. Mr. Foster says in his advice of Sept. 19—"The property will be returned into my possession for the company during the first week in October, at which time the actual dismissal of the suits will take place—the Court meeting on the first Monday in October. The stipulations to dismiss are, however, signed, and in the hands of our attorney, ready to be placed on file." Mr. Foster's letter of Sept. 19, 1877, can be read in full.

This company is at length freed from the lawsuit which has fettered all its actions and caused it so many disappointments for the past four and a half years, but it has left the company in debt with its lawyers and agent in Colorado, and the necessary official expenses in London. For the past year scarcely anything has been done on the mine—less than being unwilling to develop any property from which they might be driven out at any moment by an adverse decision of the Court. Now, however, that we have once more full and undisturbed possession of the property, we have instructed Mr. Foster to let as many leases as possible for the further development of the mine. We have hitherto done fairly in this manner of working (bearing in mind the company is without funds), but we could never get enough men to take leased contracts with us for the reason above named. While congratulating ourselves that litigation has ceased we must bear in mind that the company is in debt, and the stock and plant on the property require renovation and repair. The mill-wheel, which is situated on a splendid water-course, is of wooden construction, and Mr. Foster writes on this subject as follows:—"It is useless to suppose that the company will realise sufficient funds from the proceeds of the leases to pay the existing liabilities, and put the mill into thorough working order. It rests with the shareholders to say whether they will subscribe amongst themselves sufficient funds to carry out Mr. Foster's suggestions. You will note that Mr. Foster has urged for an advance to enable him to see the vendors in Philadelphia on his way to England, in order, if possible, to arrive at some definite and equitable mode of arranging the balance of the purchase money amounting, as you are aware, to \$25,000, to be paid only out of a moiety of the net profits of the company. Mr. Foster has been instructed to make no other terms than those offered to them two years ago, when the vendors' representative was over here—to capitalise this deferred payment, giving the vendors' stock to the amount of one-third of the capital of the company. The directors regret they were unable to send over any funds to Mr. Foster, but they have already advanced the company personally more money than they were justified in doing, and they are unaware whether Mr. Foster will come over this winter or not. Anyhow, he will carry on negotiations with the view of an amicable arrangement with the vendors. The company is deeply indebted to Mr. Foster for the trouble and patience he has exercised in the fulfilment of his duties during this long and vexatious litigation. He is a creditor of the company for a considerable amount for arrears in salary. Being unable to raise funds at the present time, the directors and two of the largest shareholders have given him some shares in recognition of his services as a bonus, that he might have a substantial interest in the property under his charge. If any shareholder is willing to augment this share, find the directors will be happy to add subscriptions to their list. It is the opinion of the directors—having laid these facts before the shareholders—that nothing definitively can be suggested until arrangements with the vendors have been settled, after which it is proposed to call the shareholders together and place before them the arrangements that shall have been decided upon. The accounts and balance-sheet to December, 1876, scarcely call for comment. The total liabilities of the company amount to \$3577. 10s. 2d. During the present year the mine has not been worked, and, therefore, the agent has no progress to report.

Mr. ORCHARD then read the letters from Mr. Foster mentioned in the statement he had just made to the meeting. The first referred to the withdrawal of the suits against the company, and mentioned that the property had been formally sold for \$200 or \$250 (the arrears of taxes), but could be redeemed within three years on payment of the principal sum, and interest at the rate of 7 per cent. per annum. The mine had always remained in the possession of the company, but Mr. Foster had been unable to effect many leases in consequence of the suits which had been pending against the company. The second letter (dated July 11) referred to the fact that by the destruction by fire of the Snowdrift Company's mill the foundations of the mill of this company had been somewhat undermined, and some repairs were absolutely necessary to preserve it from ruin. He advised that only a small sum should be spent upon this work at present until some definite arrangements were made with the vendors of the property. Mr. Orchard further stated that the mine had been worked by only two men during the last year, and they cleared about \$200 for their work. The railway had been completed to Georgetown, within two miles of the mine, and in direct communication with New York.

The CHAIRMAN said so far the company had been unable to get anything out of the property in consequence of the long-pending litigation, and having no funds to send over the title to the property had been sold for a nominal sum. It could, however, be redeemed within three years on payment of the amount of debt—between \$200 and \$300—with 7 per cent. interest. The shareholders were probably aware that the only money sent out had been about 6000, which the directors had provided themselves. The shareholders had never done anything to assist the board in the matter. The only thing they could now do was to wait to hear again from Mr. Foster, and then to call the shareholders together to decide what to do for the future, and whether or not money could be raised to carry the mine on.

The SECRETARY remarked that when the litigation was commenced, which prevented the working of the property, they were doing very well indeed, clearing about \$2000 per month. In reply to a question, the secretary said the terms of the leases made by the company were that they should receive 25 per cent. of the gross returns.

The CHAIRMAN said he thought it was only just to mention that all the business of the company in London had been done by Mr. Orchard without any remuneration whatever, not only without any payment for his own labour (which was very considerable), but without anything for his office, stationary, &c. Their secretary had had no assistance or money from the shareholders for a long time, but had very kindly done all he possibly could for the company.

Mr. T. G. TAYLOR, after referring in general terms to dishonesty of many of the vendors and managers of American mining properties, suggested that Mr. Foster should be instructed to ascertain what the company's mine would sell for, either to the original vendors or anyone else who chose to purchase it, so that the shareholders might know what was the actual position of affairs. The directors had certainly acted very honourably and very kindly in providing the funds which they had, but he thought it was now quite time that something definite should be done.

The CHAIRMAN replied that if they were to offer the mine for sale at the present time the vendors would know that the company wished to retire from the contest, and the property would go for nothing, because with the risk of further litigation, such as this company had been subjected to, nobody but the vendors would bid for the property. The better course would be, he thought, to make

a compromise with their opponents by giving them shares, and thus making their interest equal with those of the general body of shareholders. This could be effected by a rearrangement of the share capital.

In the course of some further discussion it was stated that the withdrawal of the suits against the company had certainly brightened its prospects considerably, and that the position of their affairs was more satisfactory than it had ever been. The directors had never had a farthing for their services.

On the motion of the CHAIRMAN, seconded by Mr. WILSON, the report and accounts were unanimously adopted, and it was decided that the shareholders should be called together directly further intelligence was received from Mr. Foster.

Mr. WILSON proposed a cordial vote of thanks to the Chairman, directors, and secretary for their exertions on behalf of the company. This proposition was carried. The proceedings then terminated.

#### PANULCILLO COPPER COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, on Tuesday.  
Mr. JOHN PENDER, M.P., in the chair.

Mr. J. S. ALEXANDER (the secretary) read the notice convening the meeting, and the minutes of the preceding meeting, which were confirmed. The report and accounts were taken as read.

The CHAIRMAN: Gentlemen, it is my duty to give you just a few figures in amplification of the report that has been circulated amongst you. I am glad to say that there is expected a sensible improvement towards the end of the year in the output of the ore, and we look with considerable interest to the development of the discovery in the San Pedro Mine, of which both Mr. Heatley and Mr. Welch are very hopeful. As you will know, gentlemen, there are many surprises in mining—pleasant and disagreeable—but we hope this will be a surprise of an agreeable character; that is the view of those who watch the mine, and those whose opinion is worth something in mining, and they consider that it bids well for the future of the company. At the same time we have seen so many ups and downs, not only in this company, but in other mining companies, that the best way is not to be too sanguine. If it turns out well it will be a very great satisfaction indeed. If it does not improve matters much more than at present, at all events we can scarcely be much depressed, as we believe we have in our hands a very valuable property, and if we only get a good turn in copper there is a great future for the company. I believe I am right in stating that copper has rarely been lower in price than at the present moment. I am informed that it has been 20, or 30, lower, but only for a short time, but looking at the price of copper, and the low price of coke and coal, that freights are as low or lower than in any previous period, and the further more satisfactory fact that we have a thoroughly well organised and efficient staff, we have, notwithstanding the low price of copper, all the elements of a considerable success. I hope that when war has passed, and we get into the normal position of peace and progress, that there is nothing likely to be benefited more than copper. The carbonates in the current year are likely for two reasons to cost the furnaces less; the fall in the value of copper will affect the value of their copper contents, and inland carriage, which forms an important item in their cost, is much cheaper, owing to an unusually heavy fall of rain having made pasturage plentiful. Fuel will not cost more this year than last, but, perhaps, a trifle less. The quality is believed to be better, which makes it practically cheaper even at the same cost. It may be remarked with some satisfaction that the loss of copper in the operation of smelting is estimated to be much less in the year that has just closed than in the previous one. I mentioned at the last meeting that we had got a very good vein of coke. So far as this year's experience goes we have not to report any loss by that article, and as we are consuming more coke than usual this fact is of a most satisfactory character, as we have gathered from experience. The net Chili profit in the financial year now closed amounted to \$99,000, or \$70,000 less than in the preceding twelve months. The difference between the results of the two years' operations has been mainly attributable to the lower average price received for regulus—say, \$28,000; extra amount of deadwork, \$21,000; greater incidence of general charges upon a diminished production (including London charges) nearly \$3000; dearer carbonates, \$34,000; smaller profit of Tienda, \$5000; and, per contra, a lower cost of fuel, about \$30,000. The price to be received for the regulus this year seems likely to be worse still. From the last monthly settlement to hand, for August, the price realised was \$14 3/4 cents, or 6 cents per quintal less than the average price for the six months ending on June 30, when the Chili profit was \$30,000, a difference amounting for six months to about \$1800. The deadwork, it is believed, will not be so heavy this year as it was last, and it will have been noticed in the half-yearly mining report that a sensible improvement towards the end of the year is expected in the output of the ores. These are all the matters of detail that I think it necessary to trouble you with, contrasting the position of the company in the past with its present state. I shall now, with your permission, move—"That the report of the directors submitted to this meeting, and the accompanying accounts, be received and adopted."—Mr. FRANCIS J. JOHNSTON (deputy-chairman) seconded the motion, which was carried unanimously, and without any discussion.

Mr. JOHNSTON had great pleasure in moving the re-election of the Chairman, who took a very deep interest in the affairs of the company, with which he had been connected from the beginning, and had always held a large stake in it. He felt confident that this motion would receive the unanimous support of the shareholders. —Mr. JAMES ANDREW seconded the motion, which was carried. The CHAIRMAN returned thanks for his re-election, and said he held a very large stake in the company, and he believed that, after years of watching, the concern had been placed in such a position that it would reward them well for their trouble. He (the Chairman) then proposed the re-election of Mr. James Andrew, who, as an expert and a practical man, had given the company for many years most valuable information. —Mr. JOHNSTON seconded the proposition, which was adopted. On the motion of Mr. C. JOHNSTON, seconded by Mr. JAMES, the auditors—Messrs. Harding, Whinney, and Co.—were re-appointed. The CHAIRMAN then proposed with much pleasure—"That thanks are due, and are hereby given, to Mr. Heatley for the careful and successful management of the company's business in Chili, and to the staff for the efficient support given to him." The present position of the company was very much to be attributed to the exertions of Mr. Heatley, and it would be a source of great satisfaction to him if the company were to become very successful. —Mr. HARKER seconded the motion. The CHAIRMAN said there was just one remark he wished to make, as there were gentlemen who were expecting him to make it. The shareholders were aware that a law had been passed for reducing the capital of the company. This question had been spoken about at various meetings, but they had never been in a position to deal with it. They were now in a position to avail themselves of this law, but the directors had thought it prudent until they were able by the reduction of their debentures to a point that they might consider perfectly safe and satisfactory, and were earning better prices upon their produce than they were doing at present, that they should not deal with the question—not until they were prepared to recommend a dividend to the shareholders. He hoped sincerely that before the next meeting the directors might be able to make some such proposition, and he trusted that it would be one of a satisfactory character to all concerned. On the motion of Mr. JAMES, seconded by Mr. C. JOHNSTON, a vote of thanks was passed to the Chairman and directors, and the proceedings then terminated.

CAPE COPPER.—The directors have announced to the shareholders an improved arrangement which has been made with regard to the disposal of the company's produce. At the public ticketings on Aug. 23, Sept. 11, and Sept. 25, the margin between the ruling market price of copper metal and the price given for the metal contained in the ore was largely increased in favour of the buyers, the effect of this being to throw upon this company's ore a fall in price

equal to more than double that which had occurred in copper. In the interests of the shareholders the directors immediately took steps to remedy this state of things, and they have reason to believe that they have succeeded. They have entered into a contract for the conversion of 6000 tons of the company's ore during the next twelve months into best selected copper, on terms which will give much better results to the company than would have been obtainable by the course hitherto adopted. Having thus relieved the market of this considerable quantity of ore the directors do not anticipate any difficulty in obtaining fair prices for the remainder of this company's produce in future, but should any such difficulty arise they have every reason to believe that they can also make a contract for the conversion into metal of this further quantity. During these negotiations private sales of ore have been made at better prices than at the last ticketing, though metal has continued to decline. The arrangements have been much facilitated by the company's improved financial condition during the past two years.

#### RIO TINTO COMPANY.

The directors have just issued to the shareholders the subjoined interim report, showing the company's progress during the past six months. The company has naturally suffered from the enormous decline in the price of copper, but the prospects for 1878 are considered excellent:—

At the general meeting in May last it was intimated that the year 1877 was to be held as the first working year of the company, and a promise was given to communicate to you at an intermediate period, in anticipation of next general meeting, how the business of the company was progressing.

The year is now sufficiently advanced to enable your directors to forecast that the then expected results of its working cannot be entirely fulfilled, and that the revenue account, after debiting all revenue charges and interest on bonds and floating debt, will show a deficiency.

This result arises from causes which are apparent and susceptible of precise explanation, and are such as could neither have been foreseen nor prevented. They are:—

1.—Smaller quantities of mineral taken delivery of by a majority of the buyers than was anticipated.  
2.—Smaller production of copper.  
3.—The falling off in the price of copper.

1.—As to the smaller deliveries of mineral. At the meeting in May it was estimated that at least 250,000 tons would be taken by buyers here and on the Continent during 1877, under their contracts. The chemical trade has continued so depressed that buyers generally have exercised their option of taking a minimum instead of a maximum quantity, and in some cases in which contracts are for a quantity extending over several years they have taken a smaller proportion than that which properly belongs to the current year. For this reason it is now apparent that not more than 250,000 tons will this year be consumed.

2.—As to smaller production of copper. Six months further working since May last has shown the board that the copper in the form of precipitate brought to market and delivered will probably not exceed 3000 tons metallic, instead of the somewhat larger quantity anticipated. The difference has arisen in the main for two causes: first, the process of calcination has generally taken longer than past experience had given grounds for expecting, and the delay which still exists in the arrival of the usual autumn rains will also tend to diminish the production of precipitate copper; secondly, in the early part of the year the system of selection of ore for shipment containing a due proportion of copper was not, as was stated at last meeting, sufficiently effective, the result being that for the first five months the company's receipts were seriously diminished. The quantity of material in preparation for the tanks has been largely increased during the present year, and the fall benefit of this increase will be secured for 1878.

3.—As to the falling off in the price of copper. It is within the knowledge of everyone connected with the production of copper to what a large extent the value of this metal has been affected by depressed trade, arising from war and political and other causes. Prices have steadily declined since 1875. It is due to the management to state that the steps which it was anticipated were being taken to raise the standard of the copper contents of ore sent forward for shipment by rejecting ore which contains no copper, or a very low percentage, have been entirely successful, the improved average—2 1/2 per cent. by dry Cornish assay—having been attained on the shipments made from May 30 to the present time. Such, however, is the fall in the price of copper that the benefit of this important improvement has been to a great extent neutralised. The variations in price of the copper contents of Spanish pyrites, as settled from time to time by the Assay Masters of England, have been as follows, calculating upon the present average of Rio Tinto ore:—

	January, 1876	June, 1876	January, 1877	May, 1877	September, 1877	November, 1877
per ton of pyrites	28s. 0d.	28s. 0d.	24s. 6d.	22s. 0d.	17s. 6d.	15s. 6d.

The difference of price between January and November—6s. per ton of pyrites—if reckoned upon a quantity similar to that which will be delivered by the company this year, would amount to \$6,000. The difference, however, since January, 1876, is actual 11s. per ton, which would give \$11,000. There has also been a corresponding reduction in the price obtained for the precipitate copper. In 1876 we obtained for our precipitate an average price of 15s. per unit of copper, whereas the present price is 12s. 4 1/2d., and it has been lower. A difference of only 2s. 6d. per unit would amount to about \$5,000, upon the quantity produced in the present year. From these statements it will be seen what an important influence the price of copper alone must have upon the operations of the company.

The shortcomings in receipts from these three causes will be considerable. The directors, however, draw attention to the fact that of the production of the mineral, which is the basis of the whole, there is no question. Over 700,000 tons will have been economically extracted during the year, leaving a practically unlimited quantity behind. The main cause of the present disappointment is to be traced to the unprecedented depression of trade, and any revival, to however small an extent, will speedily make an appreciable difference in the results of the company's operations.

It is satisfactory to the board to be able to say that, without taking credit for any improvement either in the chemical or copper trade, the moderately modest estimates for 1878 appear to promise receipts which should be more than sufficient to meet all the known fixed charges.

The January payments of interest and sinking fund, upon both descriptions of bonds, are provided for as usual.

Mr. Macandrew, the deputy-chairman, has just paid a visit to the mines, and while he reports that the company's works are in a satisfactory state, the directors have received from him various suggestions in the direction of improvement and economy, to which, so far as possible, immediate effect will be given.

Copied Buildings, Nov. 23. H. M. MATHEWS, Chairman.

### Original Correspondence.

#### FLAGSTAFF MINING COMPANY.

SIR,—Although the secretary of the company will sometimes give information respecting the property, yet it is not always that a shareholder can obtain what he is entitled to—that is, information respecting the management of his affairs—and as I have been at some trouble in ascertaining the truth or otherwise as to the cause of the resignation of Sir Leopold Heath, I send you a copy of a correspondence that has passed, which I feel confident will be of great interest to the shareholders. FREDERICK W. SNELL.  
George street, Mansion House, Nov. 23.

SIR,—As a shareholder in the Flagstaff Mining Company (Limited), I address you for the purpose of ascertaining the reasons for your resigning from the board of directors after the return of the Chairman and others from America. As I have been now for some time interested in the affairs of the Flagstaff Company both as solicitor to a board of directors whose object was to seek some restitution for the shareholders, as well as a large shareholder in the company, I have taken care to obtain all the information I could relating to the affairs of the company, and the accounts I have received from Salt Lake with reference to Mr. Hunter and Mr. Billing are of the most unsatisfactory character.

I only learnt yesterday that you had resigned your seat at the board, and I think the shareholders are entitled to know the cause for your so doing.

Your early attention will oblige your obedient servant, FRED. W. SNELL.  
Admiral Sir Leopold Heath.

SIR,—I do not share your opinion that there is an obligation on my part to give you my reasons for having resigned my seat at the Flagstaff board.

L. G. HEATH.  
1, George-street, Mansion House, London, E.C., Nov. 1.

SIR,—I in reply to your note of yesterday respecting the resignation of your seat at the Flagstaff board, I always understood that it was a duty a trustee owed to his certain trusts to give an account of anything affecting them, and if rumour be true that your resignation was caused in consequence of your disapproval of the conduct of the directors who went to America, I cannot help thinking that the shareholders have a right to know it. I do not wish you to give me any information except for the general benefit of the shareholders, and personally I trust on re-consideration you will do so.

Admiral Sir L. G. Heath.

1, George-street, Mansion House, London, E.C., Nov. 9.

SIR,—I shall be obliged by your favouring me with a reply to my letter of the 1st inst., and I desire at the same time to inform you that it is my intention to publish our correspondence, either with or without your reply to my letter of the 1st inst., unless you object to the same.

FRED. W. SNELL.  
Sir Leopold Heath.

SIR,—In reply to your note of yesterday's date, I can only say that upon again reading yours of the 1st inst. I can see nothing in it requiring an answer.

L. G. HEATH.  
George-street, Mansion House, Nov. 15.







## WATSON BROTHERS' MINING CIRCULAR.

Ten years ago the weekly information which had previously been published for a great number of years in *WATSON BROTHERS' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

In the year 1845, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.R.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c. &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and sharedealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

**WATSON BROTHERS,**  
MINEOWNERS, STOCK AND SHARE DEALERS, &c.,  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

**QUOTATIONS.**—The quotations in the City Article of the *Mining Journal* are not those of any individual, but of the market generally. Every Friday a list is sent to the Exchange for actual prices, as near as it is possible to get them; and these undergo the supervision of the dealers in the different shares. At four o'clock alterations are made, if necessary, and the list is then closed.

**D'ERESBY MOUNTAIN.**—The discovery on the Gorse lode, in No. 4 adit, continues worth 3 tons per fathom for lead and 4 tons per fm. for blende. The discovery was made by blasting down a part of the lode in the adit level, which has only just been cleared, and made a tramway for the stuff from the upper levels. No. 5 level, which will come in 20 fms. under this discovery, will now be cleared at once, and if the lode is found as good here the mine may rise to a great value. From No. 2 level, and a winze sunk below it, large quantities of lead were raised years ago, and the chief point of the present company has been, as we have described on several occasions, to drive No. 3 adit to get under and unwater the winze and the lead ground. This is now getting near its accomplishment, and until this new and unexpected discovery was the grand feature of the mine, which may be described as a series of adit levels into a mountain, and, therefore, worked easily, and without the expense of machinery, as all the ore can be quarried and trammed to the dressing-rooms when they are made.

"A Cautious Man" thinks we were rather too sanguine upon lead mines, and would seem to prefer just now good tin mines. Our remarks chiefly referred to progressive mines, and have been fully realised in regard to those we specially recommended. As to tin, we should very much like to see a "revival," and are disposed to think in a few months tin mining will be alive again, and sets in demand, and we have one now ready for "Cautious Man" if required. When tin was at 90¢ per ton we had just got all the machinery erected and shaft sunk in one of the prettiest sets in Cornwall. We spent close upon 5000¢ upon it, and sold about 20 tons of tin; the first lot at 90¢, the last at 35¢ per ton. Then, rather than go on working and raising tin at such a price and at a loss, we suspended all operations, and let the mine rest for better times. It has upon it a steam-engine, and necessary machinery for sinking, &c., and a water-wheel with 16 heads of stamps, and can be put to work at any moment that tin advances. A limited company might be made, and the outlay upon the mine taken in fully paid up shares.

**SATURDAY, NOV. 17.**—Market for tin shares depressed, and prices lower. Carn Brea, 44 to 45; Cook's Kitchen, 2½ to 3; Dolcoath, 34 to 36; South Conduw, 8½ to 9; Tincroft, 14 to 16; Wheal Agar, 3½ to 4; Grenville, 3 to 3½. Lead shares steady. East Van, 3 to 3½; Great Laxey, 2½ to 2½; Glenroy, 15s. to 20s.; Leadhill, 4½ to 5; Ledyard, 17s. 6d. to 22s. 6d.; North Laxey, 9s. to 11s.; Pateley Bridge, 4 to 5; Roman Gravel, 7½ to 8; Rookhope Lead, 2s. to 2½; Tankerville, 2½ to 3; Van, 32 to 34; West Chiverton, 13 to 14; West Pateley Bridge, 1½ to 2; Wye Valley, 2½ to 3; West Wye Valley, 3½ to 3½; Parys Mountain, 11s. to 12s.; West Tolgus, 6s. to 7; Richmond, 8½ to 9; Eberhardt, 7 to 7½.

**SUNDAY, NOV. 18.**—There is very little change in the general tone of the market, and prices are much about the same as on Saturday.

**TUESDAY, NOV. 20.**—Tin shares rather firmer. East Van, Rookhope, and West Wye Valley in demand. South Conduw, 9 to 9½; Carn Brea, 44 to 45; Dolcoath, 34 to 36; Tincroft, 14 to 16; Wheal Agar, 3½ to 4; East Van, 3 to 3½; Rookhope Lead, 2s. to 2½; West Wye Valley, 3½ to 3½; Great Laxey, 1½ to 2½; Roman Gravel, 7½ to 8; Tankerville, 2½ to 3; Van, 31 to 33; North Laxey, 9 to 10; Pateley Bridge, 4 to 5; Eberhardt, 7 to 7½; Richmond, 8½ to 9; West Tolgus, 6s. to 7; Parys Mountain, 11s. to 12s.; West Tolgus, 6s. to 7; Richmond, 8½ to 9; Eberhardt, 7 to 7½.

**WEDNESDAY, NOV. 21.**—The demand to-day has been for East Van, East Van, and Rookhope Lead shares. Tin stock quiet. Van, 32 to 34; East Van, 3½ to 4; Rookhope, 2s. to 2½; Glenroy, 15s. to 20s.; Leadhill, 4½ to 5; Pateley Bridge, 4 to 5; Roman Gravel, 7½ to 8; West Chiverton, 13 to 14; North Laxey, 9s. to 11s.; Pateley Mountain, 11s. to 12s.; West Tolgus, 6s. to 7; Richmond, 8½ to 9; Eberhardt, 7 to 7½; Chantles, 3½ to 4.

**FRIDAY, NOV. 23.**—Market very active for tin shares, and prices have again advanced. Carn Brea, 45 to 46; Dolcoath, 36 to 38; Cook's Kitchen, 2½ to 3; South Conduw, 9 to 9½; Tincroft, 15 to 16; Wheal Agar, 3½ to 4; Grenville, 3 to 3½; East Van, 3½ to 4; Rookhope Lead, 2s. to 2½; Great Laxey, 2½ to 2½; Glenroy, 15s. to 20s.; Leadhill, 4½ to 5; Leadhill, 4½ to 5; Roman Gravel, 7½ to 8; Tankerville, 2½ to 3; Van, 32 to 34; West Chiverton, 13 to 14; West Pateley Bridge, 1½ to 2; Wye Valley, 2½ to 3; West Wye Valley, 3½ to 3½; Parys Mountain, 11s. to 12s.; West Tolgus, 6s. to 7; Richmond, 8½ to 9; Eberhardt, 7 to 7½.

**IMPROVED DRILL.**—It is well known that with rock drills as hitherto used there is when they are in operation considerable wear upon their cutting points and edges, and the said edges wear away so rapidly that the diameter of the drill end becomes diminished to such an extent as to cause the hole being drilled to diminish to a corresponding degree, and thus the work done within a given time is materially affected. In practice it is found that the drill edges wear away to such an extent as to reduce the diameter of the hole from 1-16th in. to ¼ in. for every foot bored, more or less, according to the nature of the rock. Another disadvantage attending the use of the drills for boring rocks, as heretofore constructed, is that when a seam is encountered the drill frequently will not act, and considerable delay is the consequence, and the hole commenced has sometimes to be abandoned. The invention of Mr. W. W. DUNN, of San Francisco and London, is intended to remove these difficulties. He constructs the drill end with wings or projections extending backwards longitudinally from the cutting edges in such a manner that the wings or projections form a support against the rock or other material being operated upon, and serve also as a guide. This construction has the effect of keeping the drill end in a straight line in forming a hole, and the said hole will be perfectly round throughout its entire depth. The wings or projections may be of any desired length and thickness, and they will correspond in number with the cutting points or edges, of which they may be called continuations. The spaces or channels between the said wings or pro-

jections are sufficiently large to allow the debris or fragments of rock or other material to pass through them out of the hole. The drill may have two, three, four, or more cutting edges and wings. The improved drills may be made of various sizes, and may be applied to any drilling machinery or apparatus used for boring or perforating rocks and other like materials.

## Mining Correspondence.

## BRITISH MINES.

**ABERDAUNANT.**—S. Toy, Nov. 21: We have finished squaring the bottom of the shaft, and carried it over 5 ft. above, which is 5 fathoms below the deep adit level, where we are now driving a cross-cut north to intersect the lode.

**BEDFORD UNITED.**—R. Goldsworthy, W. Phillips, Nov. 23: The lode in the 138 east has been taken down, and so far as seen it is worth 18¢ per fathom. The lode in the same level west is worth 10¢ per fathom. All the other bargains are without any change to notice.

**BICTON CONSOLS.**—George Spargo, Nov. 21: Since my last report we have opened on the east and west lode for 12 ft. in width and 13 ft. in depth, and I believe we have now reached the hanging wall; as yet I see no sign of the foot-wall—its composition so far is as reported in my former report. This appears to be a large masterly lode, and probably in depth will become highly productive. In shooting further west we have intersected a small branch or two, but nothing worthy of notice. During the past week we have broken some good stuff from the north and south lode, north side of the valley, and as soon as dressing appliances are erected we shall be able to go to market with mineral. Every preparation is being made for the extension of day or adit levels into the hill on the course of this lode, when good backs for stopping will be obtained, and judging from present indications great quantities of ore will be taken away.

**BLAENCAELLEN.**—Edw. Owen, Nov. 21: The lode in the winze sinking below the 20, east of engine-shaft, improves as we get deeper. Capt. John Hughes, of Tal-y-bont, was here yesterday, and he valued the lode in the winze over 2 tons per fathom. The ground, though not so very hard, is so full of crevices as to make our progress in sinking very slow.

**BODIDRIS.**—H. Hitchings, Nov. 20: Everything is connection with our underground workings is going on regularly, and with all speed possible. The ground in the 40 yard level cross-cut south is still favourable for digging, and good progress is being made. There is no change in the 70 west since Saturday, as the men have been clearing out their stuff. In the 45 north cross-cut there is the same very favourable ground for producing large quantities of ore when in the lode. This mineral ground is now within 2 ft. of the roof of the cross-cut, and is rising as we advance. We shall soon have the whole of the driving in this stone, and I have every reason to believe that when the lode is reached it will be found rich. The stone in bottom of this level is producing rich quality ore for the dressing-rooms. We have during the week added some clean ore to the pile in the bin.

**CLEMENTINA.**—W. Bennett, Nov. 21: The lode in the 34 end, south of shaft, has been squeezed up very small for the last few days, but I am pleased to say that it is again opening. We have not seen anything more as yet of the east and west lode since we passed through the branches we referred to in past reports. The lode in the winze in the bottom of the 25 is still looking well; worth 1 ton of lead to the fathom.

**DE BROKE.**—J. Phillips, Nov. 21: The lode in the 45 fm. level, driving east from Wilson's shaft, is from 3 to 4 ft. wide, and greatly improved in character and product; producing excellent work for dressing. The lode in the 45 fm. level, 5 ft. wide, and containing a quantity of quartz and sulphur, with splendid specimens of lead ore. The ground in the 35 east, towards the counter lode, is favourable for progress. Good strings of ore from north to south are being met with in this drive, and I consider the prospects in this and the two bottom levels are more cheering than for some time past. The lode in the new stop in the 35, west of rise, is 8 ft. wide, and worth 12¢ per fathom. The other two stops at this level are worth from 18¢ to 18¢ per fathom, and the stone above the 25 about 12¢ per fathom. We sold on the 12th inst. 20 tons of lead ore, and are going on with dressing for another parcel of 20 tons, to sell on December 10.

**D'ERESBY MOUNTAIN.**—W. Bennett, Nov. 21: The lode in No. 1 adit end is still looking well; the part of the lode that we have been driving on is worth 1 ton of blende to the fathom, and produces some nice lead. According to your instructions, we have taken the men from this end, and put them to break lead on the gorse lode. No. 3 end is of much the same value as last week's report. I am glad to say that the large gorse lode in No. 4 level is still looking well, and quite equal to last week's report, worth 3 tons of lead and 4 tons of blende to the fathom.

**DEVON GREAT CONSOLS.**—Isaac Richards, Nov. 22: There are no particular alterations at the different points of operation since last adv. of the 15th inst.

**DUBBY SYKE.**—W. Tallentire, Nov. 19: We have driven north 5 fms., at a cost of 3½ p. fm.; set to the same four men, at 3½ p. fm. per fathom. I think this north and south vein we are driving in is very likely to be productive in the limestone above. It is composed of soft run rider and carbonate of baryta—quite suitable mineral for a matrix of lead ore. This vein has not so much throw as the other veins that we have tried, and will have two limestone cheeks, which, without doubt, will give it a better chance of being productive.

**EAST VENTNOR.**—D. Williams, Nov. 22: The top level is cleared and repaired to the bottom of the new shaft. The vein is 5 ft. wide, and producing good leadstuff for dressing. We shall commence sinking the shaft to the 42, and drive the latter to get under the shaft with a full pair of men. In the cross-cut south from the 56, to cut Woodhouse vein, we have every indication of being close to the vein, having cut another branch of spar with good spots of lead ore; and the ground being a little easier to work, good progress is being made. I strongly advise driving east upon Roddill vein, in the eastern part of the mine. This vein is one of the champion lodes in the district, and is in the present and about 7 ft. wide, and mixed with spar and spots of lead ore.

**EAST DAREN.**—In the 80, east of engine-shaft, on the south lode, the lode is 3 ft. wide, yielding 1 ton of lead ore per fathom. In the same level west nothing has been done since last setting day, being short of hands. In the cross-cut north, in the 80, the ground is a little easier for driving, being composed of a dark clay-slate and branches of carbonate of lime, containing spots of lead and strings of mundle, and we look forward to intersecting the north part of the lode in a few days. The tribute pitches throughout the mine, five in number, are without change to notice. Our machinery is in good working order. Drawing 12 tons of ore per fathom. In the same level, west of winze below the 120, the lode is producing saving work. These points will be communicated now very shortly, and the level continued on east of the winze, where we hope to open out some good ore ground. 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states that the directors, being dissatisfied with the prices received for their ore, propose converting during the next 12 months 8000 tons into best selected cop.



by which they expect a better result will be attained. West Tankerville, 5 to 7; North Lacey, 8 to 10; I.X.L. 5 to 7; East Caradon, 7 to 10; Chapel House, 3 to 4; Alhami, 4 to 4; Thorpes Gawber, 2 to 3; Newport Abercrombie, 3 to 4; Birchall Lane, Nov. 22.

With this week's Journal a SUPPLEMENTARY SHEET is given, which contains—Original Correspondence: Rock-Boring Machinery—No. XI. (illustrated), J. Darlington; Rock-Boring (F. J. King); Separating Silver from Copper with Glue; Major Majendie's Report on the Burnbank Explosion; Explosives—Dynamite, Gunpowder, Tonite, Weder Granite, and Street Pavements; New Contrivance for Making Roadways and Footpaths (E. H. Nolan); Electric Lighting (A. Vassard); The New Quebrada, and the Bolivar Railway Company (E. D. Mathews); Pacific Coast Notes—Eastern Nevada (J. D. Power); Flagstaff Mining Company (O. H. Phelps); New Quebrada Company; Javali Company; Price of Tin; Llanrwst Lead Mine; Vale of Conway Mining Company; Mining in North Wales—East Pant du Mine (J. A. Ede); Ystrad Elinion Mine (J. Davis); Treblich Consols (U. Latreille); the Present Age (R. Tredinnick); the Mining Interests (R. Tredinnick); the Old Treblich Silver and Lead Mine; Gwynap Great Addi (R. Symonds); Fatal Practical Joke—Almadá and Tinto Consolidated—Mining in Australasia—Monthly Summary—Australasian Mines—H. R. Mursden's Ore Crusher and Engine Combined—New Arrangement (illustrated)—Patent Matters, &c.

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## The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, Nov. 23, 1877.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Fig. 6MB, f.o.b., Clyde.	2 12 0	2 12 1/2	English, ingot, f.o.b.	74 0 0	74 10 0
Fig. 6MB, f.o.b., No. 1.	2 14 0	2 14 1/2	" bars	75 0 0	75 10 0
Fig. 6MB, f.o.b., No. 2.	2 14 0	2 14 1/2	" refined	75 0 0	75 10 0
Fig. 6MB, f.o.b., No. 3.	2 14 0	2 14 1/2	Australian	67 10 0	—
Fig. 6MB, f.o.b., No. 4.	2 14 0	2 14 1/2	Banca	71 0 0	—
Fig. 6MB, f.o.b., No. 5.	2 14 0	2 14 1/2	Straits	67 15 0	—
Fig. 6MB, f.o.b., No. 6.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 7.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 8.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 9.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 10.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 11.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 12.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 13.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 14.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 15.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 16.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 17.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 18.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 19.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 20.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 21.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 22.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 23.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 24.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 25.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 26.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 27.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 28.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 29.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 30.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 31.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 32.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 33.	2 14 0	2 14 1/2			
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Fig. 6MB, f.o.b., No. 84.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 85.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 86.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 87.	2 14 0	2 14 1/2			
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Fig. 6MB, f.o.b., No. 90.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 91.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 92.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 93.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 94.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 95.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 96.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 97.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 98.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 99.	2 14 0	2 14 1/2			
Fig. 6MB, f.o.b., No. 100.	2 14 0	2 14 1/2			

\* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; 1X 6s. per box more than 10 quoted above, and add 6s. for each X. Terne-plates 2s. per box below tin-plates of similar brands.

REMARKS.—Our markets have not undergone any material change, either in regard to the demand or in prices; neither do we anticipate more than slight fluctuations during the ensuing month, for there is little room for further reductions; and, on the other hand, our markets are barely strong enough to maintain a rise. There are reasons, however, for believing in the beginning of the end of the long depression, and sellers may now fairly make a stand, prices being sufficiently low to meet the necessities and requirements of buyers; but we doubt whether the aspect of affairs is deemed sufficiently encouraging yet while to induce many to operate largely. The principal cause of the decline in our market is owing to the disturbed state of European politics, and therefore they claim special attention, for whichever way they may turn the future of our markets depend, as nothing would create greater confidence than the restoration of peace to Turkey, and the formation of a strong and popular Government in France, and the achievement of these two events would be the first step towards clearing the course and making ready the way for renewed activity, and the subsequent realisation of enhanced prices. But are matters still so obscure that they cannot be penetrated? Cannot a conclusion be drawn from recent events? Will a vain show of resistance avail, and is not the struggle drawing to an issue? The resignation of the French Ministry, and moderation and forbearance of the Left, are they not guarantees of good order and safety? It behoves all who are interested in our market to consider well and determine the exact position of affairs, and to regulate their movements accordingly. The main question to decide is whether prospects favour war and revolution, or peace and good government, because if the war is prolonged and political agitation continues in France, there will, of course, be no such amelioration, whereas peace and an amelioration of the French difficulty will entirely reverse the whole character and tendency of our markets. Hitherto little has been found to afford unimpaired satisfaction, and the year up to the present date has been exceedingly gloomy and unprofitable—full of restrictions and embarras, continuous disturbances and uncertainties, and choked with difficulties and calamities.

There has been a succession of evils of an alarming, serious, and damaging character, tending greatly to disturb the equanimity of our markets, and to shake and undermine their foundations. The tremendous pressure to which they have been repeatedly subjected has been irresistible, and they have succumbed to a calamitous state of affairs generally, it is a matter of congratulation that prices have not suffered to a greater extent. The losses incurred on sales, and the depreciation in market value of stocks, must necessarily be enormous, and it will undoubtedly take some time before recuperation can be effected; nevertheless, we are encouraged to hope and to look forward to better times presently. The crisis, however, has not yet passed, and patience and caution must be exercised for a short time longer, as a too sudden reaction would not be attended with any permanent advantage just now, for our markets are still too feeble and depressed to respond to a strong upward movement. The stocks of metals are heavy, and they naturally influence prices downward while there is so little buying going on, but so soon as ever there is a general resuscitation in trade they will make little or no impression, and be wholly disregarded. Our markets have been represented as having attained the maximum of stocks with the minimum of demand, and if this is so then their position has been upheld remarkably well, and it speaks volumes for the future. It is, perhaps, rather tantalising when business is so dull to be always told that the future will make up for the deficiencies of the past and present, especially to those who are struggling hard to hold up against adversity, as the good times may come a little too late for them, and we fear there are many who are already pretty well exhausted, and are greatly distressed to know what to do for the best. To such we would say abandon speculation, and avoid all risks until the crisis has finally passed.

COPPER.—Profound quietude has reigned supreme in our market, and the tendency has been towards easier rates. French and Indian orders have been extremely limited, and reduced prices appear to have no influence in promoting business. We fear the reason that our market still keeps depressed is in great measure owing to what we have so often pointed out as injurious to the trade and prejudicial to the interest of importers—the retention of large stocks of Chili in first hands; and until they are distributed amongst dealers, or otherwise disposed of, the market will be slow to progress. The Australian companies, whatever their fallings or shortcomings in times past, certainly set a very good example to other importers in this respect, and the Wallaroo and Burras companies particularly, for they do not withhold their copper from the market any unreasonable length of time after arrival, and such an unequivocal mark of business tact redounds to their credit, besides advancing their interests. The course of the market during the week is a corroboration of the fact, for while Chili has receded Wallaroo and Burras remain firm. Burras being rather scarce is mostly held for higher prices. As the settlement of the last public sale must be made next week the position of Burras and Wallaroo may be expected to improve. On Monday last the charter from Chili for the first fortnight of November were telegraphed as 2100 tons—1550 tons bars and ingots for the United Kingdom and 550 tons for the Continent. At the Swansea Ticketings, on the 20th inst., 2059 tons of ore were sold at 11 1/2d. per unit of produce in the whole sale; they were all low produce ores, the highest being only 8 1/2d. per cent. There will be no sale on the 4th prox. By telegram from Calcutta, the 21st inst., copper tile was quoted 31s. 8s.; bradries, 32s. 12s.; yellow metal, 26s. 4s. By the mail leaving Bombay, Oct. 27, the report of that market showed a decline of 6 annas per cwt., and yellow metal tending in buyers' favour. By the mail leaving New York on the 10th inst. copper was stated to be in steady and moderate demand, also yellow metal. Ingots were quiet, sales were not pressed, but manufacturers held off; the price of Lake was quoted 17 1/2d.

LEAD.—The market assumes a quiet aspect, and prices have further receded 5s. per ton. By advices from New York, on the 10th inst., English pig was stated to be without demand, and prices wholly nominal. The stock of domestic was being closely concentrated, but the market was dull and unsettled, and sales only of 20 tons reported at 4 1/2d. Selected firmer, with 5 c. demanded, and

not much stock offering at that figure. The quantity of lead in store was 3025 tons; at smelting works about New York, 1800 tons; lead and bullion in transit from California by water, 1520 tons; base bullion in transit by rail (lead ready this month and next), 600 tons; and Western lead, bought for Eastern delivery, 750 tons; together, 7695 tons in sight.

SPELTER.—Silesian variety but little, and continues to be quoted 19s. 5s. to 19s. 10s. per ton. English hard little enquired for, and prices lower, especially for the favourite brands.

STEEL.—Foreign has not undergone any particular change, but the hour is in favour of buyers. The Sheffield market is dull, and prices are said to be tending from an unremunerative pitch to an absolutely ruinous one, so far as regards iron, and the steel departments are also in a very unsatisfactory state. The orders in hand at Bessemer steel are chiefly for India. The following statement of the Italian Consul at Florence ought to receive the earnest attention of our English steel trade, for it is stated that the English iron and steel trade is on the decrease in Italy. From the first introduction of railways into Italy the rails were chiefly, if not entirely, imported from Great Britain, originally of iron, and of late years of steel. Now, however, it would appear that English manufacturers are losing their hold of the Italian market, and that the French, German, and Belgian makers are taking their place. The tenders for steel rails which were issued in the early part of the present year by the three great Italian railways, the Adriatic, the Northern, and the Southern, all taken up by French, Belgian, and German houses, to the exclusion of English firms, at rates varying between 191 frs. 50c. and 204 frs. 60c. per ton, f.o.b. at Italian ports. It has been stated that the Germans were working at a loss. Be this as it may, the English market in the meantime is going, and not for rails only, but also for locomotive engines, axles, tyres, springs, tools, and the lower qualities of iron. It may be said that the quality of the foreign steel is inferior. Of this there seems no proof as regards French and German; in any case the article appears to satisfy the purchaser. A readiness to adapt to the wants of others may be among the qualities which give foreign a preference on the Italian market over English manufacturers.

IRON.—The iron market shows no appearance of improvement, and the additional demand that sprung up for merchant iron a short time since has considerably abated, and although every effort is being made to maintain the slight advance that was then effected in bars, yet it will be a difficult task to accomplish in the face of such reduced quotations for Belgium, which are comparatively so very much cheaper. Some of the makers of the lower quality of iron in Wales and on the East Coast have discontinued rolling bars for a time, and are turning their attention to work that involves less loss or closing their mills entirely. This, together with the diminished make of others, will doubtless enable those masters who continue to roll to obtain better prices than they would otherwise succeed in doing, and there will, probably, always be a certain amount of local trade, as well as a little shipping demand to be secured, but nothing in proportion to what it might be. It is not but what the demand for iron for general purposes is as great as ever, and our works ought to be full of work instead of shutting up, but we do not benefit by the demand, as it goes to Belgium. If the quantity of iron which is now imported from Belgium was manufactured in this country the makers of common iron would have no great cause for complaint, but this portion of the business is lost, and it will be difficult, if not impossible, to recover unless iron is sold equally cheap in England as it can be imported from Belgium and elsewhere, and it ought to be sold cheaper, considering the expenses to which foreign iron is subject before it reaches here. To the importation of Belgian iron may be attributed the distress prevailing in the iron districts of Wales, and yet the men appear to prefer their ease and present miserable existence rather than accept work on such terms as might direct the orders more into their hands. The Belgians have completely out of their living, and they have not the courage and fortitude to work upon corresponding terms, but tamely submit, and let the Belgians take their work while they remain in idleness, wasting time, energy, and means, to the disgust and injury of the whole nation.

The Staffordshire makers are also very short of work, and the same applies to most districts throughout the country, but it is a most extraordinary circumstance that orders should have fallen off so much now that prices are so very reasonable, and there was a better demand at higher prices than now, and the only way in which it can be accounted for is by reason of the foreign markets getting over supplied by consignments, and as we have before stated the competition of the Belgian houses. Many of our ironmasters have little to do that rather than stock up with iron, they prefer to see the trade of the country carried away from them by other nations, not because we are worked out and have no material to fall back upon. The large production of pig iron is a proof to the contrary, for in that case we should have fulfilled our mission, and must depart, but simply on account of bad management, the want of reciprocity of feeling, and a proper understanding between masters and men, and the consequent loss of energy, perseverance, and British pluck. The nation is forfeiting its former reputation for being the cheapest and best iron producer, and perhaps before very long we shall degenerate and only rank as a third or fourth rate suppliers of iron, and quite unable to hold our own against a little country like Belgium. It is really most disgraceful on the part of owners and proprietors of such property that they do not bestir themselves in some manner to readjust and reorganise the whole system of the iron trade that, we may again come to the front and recover and retain the principal business we formerly possessed in supplying the world with iron. If there are royalties in mines, let them be cut down just one-half, or more if need be, and be with the rents and the terms of leases and agreements for concessions must be made all round, for it is better to secure half a loaf than none at all, and the trade seems to be fast coming to a standstill, and change is not shortly effected in the production and manufacture of iron. Scotch pigs are now quoted 5s. 1 1/2d. m.n. cash.

Week ending Nov. 18, 1877.	Tons	Value
Week ending Nov. 11, 1877.	8,181	7,369
Decrease	—	812
Total decrease for 1877	—	11,857
Imports of Midland through pig iron into Grangemouth:—		
Week ending Nov. 17, 1877.	7,223	—
Week ending Nov. 10, 1877.	3,240	—
Increase	—	3,233
Total increase for 1877	—	70,112

IN BLAST Nov. 18, 1877. 117  
In blast Nov. 17, 1877. 88  
TIN.—The market has been wavering and difficult to understand; the variations in prices, however, have been unimportant, and only moderate sales are reported. Speculators who bought at the top of the market are naturally anxious to see the price back again to 71 1/2, and they will undoubtedly do their best to give support to the market, but buyers generally have no idea of the market at such a price, and consider that 67 1/2 is much nearer the value of foreign tin, and there are some who still look upon 65s. as an outside price; but if the present market price is maintained it will leave a very nice profit to some of the arrival parcels. It is a pity that the price was ever forced up to such an unnatural height so suddenly, as the reaction has so completely shaken confidence, which is invariably the case in an artificial market. Had the price been advanced within reasonable limits—say, 2s. to 3s. per ton—there would still be a strong market instead of a doubtful one as at present, and no one would have objected to the rise, but when the movement was so sudden, and the price was so high, it was against and against. Sudden movements are naturally attended with mischievous consequences, and someone unfortunately is sure to suffer losses by them. The accounts from Australia seem to differ as to the price at which tin has been selling there; some importers state as low as 58s. to 60s., but from unquestionable authority we hear of 61s.; but since the rise here a recovery has taken place in the Australian markets to a greater extent; nevertheless, as the full advance on this side has not been maintained, the Australian markets will doubtless in like measure be affected. The advices respecting supplies do not encourage the belief that many include in of any apparent falling off in supplies, and the shipments of just one or two months are not a reliable guide for anyone to act upon with any degree of certainty, as that may arise purely from accidental causes; and consequently no criterion of any permanent increase or decrease in production, and what we want is definite intelligence about the cost of production and the power of production before it will be safe for anyone to buy tin or to keep tin in the hope of realising higher prices. A temporary advance such as we have recently experienced may occur again, but then investors seldom or never take advantage of these fluctuations, they are meant them, as they go in for a long shot; consequently they lose these little pickings, which is certainly a great mistake, for there is scarcely a rise of any importance ever takes place without being followed by a reaction, and those who lately had the opportunity of making 5s. per ton ought to have secured it.

There is no great inducement to buy at the present time; we are approaching a dull month, the last of this most unfortunate year, and consumers always prefer to keep down stocks about this time, and to let engagements run off, and quietly to await the advent of the New Year. The money market is a little uncertain, the Bank rate at 5 per cent., and cheap money cannot be reckoned upon to aid the market. The French crisis is another talk to any upward tendency at the moment, but we hope the Marshal will have the good sense to comply with the expressed wish of the nation; at the same time he does not seem very ready to do so. Then, again, there is the wretched war, which is enough of itself to keep everything in a state of suspense until we hear upon what terms peace will be settled. Nevertheless, we are not inclined to take a dismal view of coming events, because we think wisdom and humanity must shortly prevail, and as business has been so very contracted, and prices are so moderate, there is clearly room for an improvement, and as soon as ever the political horizon brightens it will begin when that will take place is a problem. One thing is certain—we are not yet out of the wood, and it would, perhaps, be better under all the circumstances, to go on steadily for a time than to incur unnecessary risks for an imaginary advantage. The advices from New York report tin to be quiet but steady, the favourable foreign advices and the statistical position giving support, notwithstanding the limited demand. From Penang, Oct. 20, the report states a fair demand existed for China and India, and at times also for Europe and America. Prices had fluctuated between 62s. 6d. and 72s. 6d. coastwise and foreign, but the market closed weaker at 69s. 9d. 7 1/2. The stock amounted to 4500 piculs, including 3500 piculs held on speculation, but not offered for sale.

QUICKSILVER.—The importers have not changed their price from 71s. 5s., but during the week have at times stopped selling, and at others only given off part of the quantities applied for. Their stock is now reduced to very small dimensions. San Francisco remains

unaltered at 44 1/2 to 45 cents, and the receipts for the month of October were 5942 flasks, against 6456 in 1876.

THE MINING SHARE MARKET has been moderately active this week, and a fair amount of general business transacted without any material rise in prices. The tendency, however, is upwards with many mines, and the shares in them are scarce when wanted. The mines mostly dealt in have been Rookhope, North Lacey, Parys Mountain,



now about, and leaving on hand at the mine ore of the value of £5000 net. Port Phillip and Colonial,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; the company's share of the divided profit for the month was £1700, the remittance £1500.

Cape Copper, 31 to 33; in view of the constantly increasing difference between the market prices of metallic copper and copper in the ore, the directors have entered into a contract for the conversion of the ensuing year of 6000 tons of ore into best selected copper, paying so much per ton for the conversion; this will, of course, relieve the market of so much ore, and secure the Cape Copper Company a share of the smelters' profits. It is hoped that by this means their prices will be obtained for the remainder of the company's ore thrown upon the market, but should this not be the case the directors will arrange to have all their ore converted into copper.

Rio Tinto, Spanish Coupon Bonds, 54 to 56; 7 per cent. Mortgage Bonds, 14 to 14 $\frac{1}{2}$ ; shares, 23 to 31; the directors' interim report, issued this evening, states that the results of the year's operations anticipated at the May meeting, cannot be entirely fulfilled; and the revenue account, after debiting revenue charges and interest on bonds and floating debt, will show a deficiency. Owing to depressed trade, the consumers have exercised their option of taking a minimum instead of a maximum quantity. There has, therefore, been a somewhat smaller production of copper, but the quantity of material in preparation for the tanks has been largely increased during the present year, and the full benefit of the increase will be secured for the year 1878. The price of copper has steadily declined since 1875. Spanish pyrites of corresponding quality realised 29s. 6d. in January, 1876, and the price fell to 24s. 6d. in January, 1877, and to 18s. 6d. in November, 1877. The difference of 11s. per ton amounts to £20,000 upon the company's annual output. A difference of 2s. 6d. per unit would give them £50,000. Yet over 700,000 tons of mineral have been economically extracted during the year, leaving a practically unlimited quantity behind; and without taking credit for any improvement in the chemical or copper trade the lowest estimates for 1878 appear to promise sufficient receipts to meet all known fixed charges. The January payments of interest and sinking fund upon both descriptions of bonds are provided for, as usual.

St. John del Rey, 320 to 330; the latest telegram from Morro Velho, dated Rio de Janeiro, on Monday gives the produce for the first division, nine days, of November at 12,250 oits., of the value of £477, the ley of the ore being 74 oits. per ton. Don Pedro North del Rey,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; the new incline tramroad has been completed to the 330, and they have resumed drawing ore therefrom; they are making various other improvements, which will result in greater speed of working and less expense. Capt. Vivian states that the works underground and at surface are progressing very satisfactorily, and first-class duty is being accomplished. The ore yard at the reduction works, which for many years has been exposed to all weathers, is now being roofed. Santa Barbara, 14 to 15; the September produce from 885 tons of mineral was 2669 oits., of the value of £1134, the ley of the mineral stamped being 3016 oits. per ton. The cost was 1007 $\frac{1}{2}$ , leaving a profit for the month of 127 $\frac{1}{2}$ . The lower output is ascribed to absence of the working force, and not to any change in the mine. The average quantity of ore raised per tonner for the month was 29 tons.

Almaden and Tinto,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; the directors have received a very important telegram from Mr. Breach:—"No profit for October. Lode cut south of south slide. Ground improving towards the south." The great interest attaching to this communication arises from the fact that it had been feared that the south slide therein referred to would have cut off the lode altogether. Instead of this the lode has been found as described, and since, on the south side of the slide it will be standing untouched to surface, the executive regard the news as highly encouraging. Condes de Chili, 2 to 3; the variable weather has interrupted the work. In the deep adit the ground has been harder, and only 9 metres, making 14 $\frac{1}{2}$  metres driven in all from the mouth. The snow has prevented anything been done to the andarivels, but the first section will be completed shortly. Capt. Seccombe finds no difficulty in supplying all the transport troops with best ore for England. The jiggling machines will shortly be fixed at La Vega, but very little can be done with them until the andarivels are completed. The mines are reported to be opening up rich for silver-lead ore.

New Quebrada, 24 to 25; it is stated that an arrangement is being made under which the New Quebrada Mining Company and the Rio de Janeiro Railway Company will be amalgamated, and it is added that Messrs. John Taylor and Sons will have an important voice in the management. Steps will then be taken for opening out and working the three mines belonging to the company in a large way. Great importance is also attached to a reported important discovery of a massive lode of ruby ore in connection with the exploratory level set on foot by Mr. Darlington some time back.

The news from Utah is generally encouraging, and a communication from Salt Lake state that the first shipment of ore from the famous Emma Mine was made by the present proprietors on Oct. 23. Operations have been suspended for five years. There are 30 men employed, and they are obtaining high grade ore, of which daily shipments were anticipated. It is added that "all mining experts acquainted with the neighbourhood of the Emma Mine have always regarded the lode to be quite as rich as it was represented to be to the English purchasers, and we shall confidently expect to see this demonstrated in a few months." Flagstaff, 2 to 2 $\frac{1}{2}$ ; private advices are said to confirm the announcement of extensive and rich discoveries of ore in the westerly portion of the mine. Large quantities of yellow carbonate are being daily raised, and the mine is still asserted to be doubled in value by the important discoveries simultaneously of high class ores in three of the lowest levels, and on far away from the shaft. The second and first levels are now being driven with the hope, it is stated, of intersecting the bonanza at higher points, and no doubt seems to be entertained that both these shafts will also tap the great ore body. The mine is working well, and the output is reported to be increasing. Hunter Consolidated, 5 to 5 $\frac{1}{2}$ ; the manager reports that they are turning out about 4 tons of bullion per day when everything works well, which yields them about \$350 per ton; they have shipped 40 tons, worth \$16,510. The latest telegram received states that the furnace has run seven days, producing \$11,000.

Last Chance,  $\frac{1}{2}$  to 1; satisfactory advices have just been received from Utah by the directors with regard to the position and progress of the company. It is stated that the subscriptions for the 15 per cent. debentures have been well responded to by the shareholders, and a further appeal is now being made to them, as well as to the public, to take up the small balance now remaining. No doubt is entertained that the balance will be quickly taken up, as the security is considered unexceptionable. The rate of interest offered is apparently high, but it is explained that the normal rate of interest in Salt Lake City is 2 per cent. per month, or 24 per cent. per annum. Money can, it is said, be readily obtained in Utah on the security of the mine owing to its established reputation, but it is cheaper for the company to borrow at 15 per cent. in London, and give the shareholders the benefit of the transaction at liberal rates than pay 24 per cent. in Utah with its attendant disadvantages. The success of the subscriptions is stated to have enabled the board to make preparations to commence work. Everything, therefore, is considered to promise that the mine will shortly occupy a prominent position amongst the most successful and best dividend-paying mines in America.

Richmond, 8 to 9; the usual weekly telegram states the week's output to have been \$75,000 from 1000 tons of ore, with three furnaces. The yield of the refinery during the week was \$35,000. Everything is going on well. The manager (October 30) reported that they had been drifting on the main 200 drift; all the distance (30 feet) produced ore. They would next week commence to sink the winze on the 200 to prove it in depth. The Sentinel (November 3) states that the winze of no diminution in the extent of the ore bodies, and that the ore extends up to the usual standard of value. The amount in sight is enough to insure a long and profitable run for the three furnaces now in operation, and if the present indications develop as expected additional ones will be opened up. Prospecting is being carried on with great vigour, and with every prospect of good results. The English Commission are still pursuing their investigations, and are busily engaged in the task devolving upon them. They have examined the mine from top to bottom, examined into the workings of the refinery, the operations of the furnaces, and overhauled the office accounts. It is expected that they will conclude their labours in two weeks from date. Their con-

clusions as to the present status of the Richmond Mine must, by reason of circumstances, be a favourable one, and we look forward with interest to their report to the company in London.

Eberhardt and Aurora 63 to 74; it will be recollected that the official telegram, published three weeks since, stated that the ledge struck in the tunnel contained only \$4 of silver per ton. While this could be fairly regarded as an encouraging indication, Capt. Frank Drake, properly enough, announced that there was no cause for excitement. Local contemporaries continue to affirm that the recently struck ledge is of exceeding richness. The Eureka Sentinel states that the vein encountered in the Eberhardt and Aurora tunnel at Hamilton runs almost parallel with the course of the tunnel to the north-east, and pitches downward. It has been uncovered for a distance of 25 ft., the formation consisting of white spar and quartz, and interspersed therein were bunches of chloride ore of exceeding richness and assaying very high. We learn that the superintendent will drift on the vein, and is confident that a handsome ore body will be developed. The indications are certainly very encouraging, and the ore being met with at such a depth is a demonstration that the country is no argument against the permanence or continuity of the rich outcrops and surface deposits that once made that locality famous.

Exchequer, 3s. 9d. to 6s. 3d.; as yet no official announcement has been made of any alteration in the position of the company's affairs. The Virginia City Evening Chronicle (Oct. 15) states, however, that Robert Hunter, an old miner and prospector, who came to the Comstock, in 1869, to fight the Indians, and who has been foreman of the Exchequer Mine in Alpine county, California, for the past nine months, says that the Exchequer is located on a true fissure, that the ore proves richer as depth is attained, and that 400ft. below the surface, the present depth of the Exchequer, the ore will go \$400 to \$500 per ton. That country, Mr. Hunter says, will yet make considerable noise in the mining world. I.X.L., 3s. 9d. to 6s. 3d.; the engine-shaft is down 40 ft. below the 300 station. The same streaks of quartz struck a few feet above the 300 station continue to go down and increase as depth is attained, and there are indications of a ledge being close by. Hultafall, 4 to 5, but no enquiry; good reports are said to have been received from the mine during the week. The agent says that the ore coming out is, if anything, superior to that raised in the adjoining mine. The whole of the machinery has been shipped, and the greater part of it had arrived at its destination. Rapid progress is being made in its erection. The deepest workings are said to be the richest yet seen since the commencement of the undertaking.

Lead Mines have been in general request, and a fair amount of business has been transacted. Van, 30 to 32; Seaham's shaft is down 94 fms. below the 105, where the Bastard lode has been intersected. There is no change reported elsewhere from the mine. The new engine and crusher on the halvan floors have been started, and matters are progressing much as usual. Grogwinion, 3 to 4; there is no news to report this week. Wye Valley, 2 to 3; the latest news from the mine is of a cheering nature. The appearance of the 22 east is more favourable than for a long time past, and the lode is showing more ore. The new level at the 46 is making good progress both east and west, and going in the latter direction towards the rich discoveries in West Wye Valley Mine. The lode is opening out satisfactorily, and looking promising for early discoveries. Tippet's shaft is opening up some promising ground, and a fair quantity of ore has already been observed in this part of the mine. The new capital (\$3000.) will enable both the shafts to be sunk to the required depth, and the deep levels to be driven into the ore ground, as recommended by Mr. Kitto in his annual report.

West Wye Valley, 3 to 4; the annual meeting is called for Dec. 3, and the reports and accounts are satisfactory. It is stated that the first sale of 50 tons of lead will take place before the end of next month. The sinking of Brooke's shaft is still going down in rich ore ground. Red Rock, 2 to 2 $\frac{1}{2}$ ; sales of lead have begun at this mine, a parcel of 40 tons having been sampled for sale on the 29th inst. This has taken place within a year from the commencement of operations, and speaks well for the energy of the management. The mine is reported to be looking very promising. South Cwmystwith, 3 to 4; sales are to commence at this mine during next month, and will be followed by regular monthly parcels, of sufficient size to ensure satisfactory profits being made. The mine is opening out very favourably. Caron, 2 to 2 $\frac{1}{2}$ ; capital progress continues to be made at all points, and the new shaft is expected to be completed in about ten days' time; the lode continues to improve in a most encouraging manner. St. Harmon, 2 to 3; the mine has lately improved at several important points, and the prospects were never before so good as at present. The lode in the 35 is very much improved, and a fine stope about 12 fms. in length is now being worked.

Pateley Bridge, 4 to 4 $\frac{1}{2}$ ; the Rake vein in the 40 east is 8 ft. wide, and worth 6 tons of lead ore per fathom. Westward the vein is looking well, and carrying a rib of solid ore 2 in. thick; and 8 fms. in advance of this end, in No. 1 winze, the lode is standing, worth 2 tons per fathom. Other parts of the mine are improving, and smelting is progressing satisfactorily. The agent reports that from the 30, east on Rake vein, he has thus far this month raised and dressed 20 tons of ore. West Pateley, 2 to 2 $\frac{1}{2}$ ; these shares have been in request, and close firm at quotations. The demand, it is said, has arisen from the continuance of the discovery in the 20 fm. level in the No. 2 shaft, and the encouraging way in which the mine generally continues to open out. It is understood that the Chairman and certain shareholders visited the mine this week, and, encouraged by the recent discoveries, decided upon a yet more extensive scale of operations.

Subjoined are the closing quotations:—  
Ashington,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Carn Brea, 4 to 5; Devon Great Consols, 2 to 2 $\frac{1}{2}$ ; Dolcoath, 3 to 3 $\frac{1}{2}$ ; East Caradon,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; East Lovell, 1 to 1 $\frac{1}{2}$ ; East Van, 4 to 4 $\frac{1}{2}$ ; Glenroy Lead,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Glyn,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Great Laxey, 21 to 22; Leadhills, 4 to 5; Marke Valley,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Parys Mountain,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Pateley Bridge, 4 to 4 $\frac{1}{2}$ ; Penrith, 5 to 5 $\frac{1}{2}$ ; Roman Gravel, 1 to 1 $\frac{1}{2}$ ; Rookhope, 22s. 6d. to 23s. 6d.; Tankerville, 4 to 5; Tintock, 18 to 19; Van, 30 to 32; West Ashington,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; West Basset, 2 to 2 $\frac{1}{2}$ ; West Cliverton, 13 to 15; West Pateley, 2 to 2 $\frac{1}{2}$ ; West Tankerville,  $\frac{1}{2}$  to 1; Wheel Grenville,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Almaden and Tinto, 5 to 6; 18ths; Ardara, 2 to 2 $\frac{1}{2}$ ; Birdseye Creek,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Blue Tent, 3 to 3 $\frac{1}{2}$ ; Cape Copper, 32 to 33; Cedar Creek,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Chontales,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Colorado Terrible, 1 to 2; Condes de Chili, 2 to 2 $\frac{1}{2}$ ; Don Pedro,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Eberhardt and Aurora, 6 to 7; Exchequer, 4s. to 6s.; Emma,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Flagstaff, 2 to 2 $\frac{1}{2}$ ; Frontino and Bolivia, 2 to 3 $\frac{1}{2}$ ; Hultafall, 4 to 5; I.X.L.,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Javali, 6s. to 8s.; Kapunga,  $\frac{1}{2}$  to 1; Last Chance,  $\frac{1}{2}$  to 1; New Quebrada, 2 to 2 $\frac{1}{2}$ ; Penrith, 5 to 6; Parys Mountain, 2 to 2 $\frac{1}{2}$ ; Port Phillip, 9 to 10; St. John del Rey, 320 to 330; Sierra Butte, 1 to 1 $\frac{1}{2}$ ; South Aurora,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Teocoma,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; United Mexican, 1 to 1 $\frac{1}{2}$ ; Oregon pref., 4 to 4 $\frac{1}{2}$ .

COLLIERIES.—During the past week but few alterations have taken place in the prices of this class of shares, though a strong enquiry has prevailed for those of the best established companies. Chapel House shares have been strong in demand, and close firm at 3 to 3 $\frac{1}{2}$ . We are informed that the second new pit is now down 335 yards, and is being pushed on as quickly as possible. The new engine house is nearly completed, and will be ready to be roofed in by the end of next week. The engine will also be in place. The profits are fully maintained at a rate of 2s. per ton, and the price of coal being even a higher rate may be reached ere long. Allfami shares have also been required for at slightly better prices, the closing quotation being about 4 to 4 $\frac{1}{2}$ . The new works are progressing in a satisfactory manner. Llyf Hall close at about 9 to 9 $\frac{1}{2}$ . Cardiff and Swansea shares have been dealt in at about 1 to 1 $\frac{1}{2}$ . Business in South Wales is improving, and the prices of fuel remain firm, with an upward tendency. A rise of only a few pence per ton will prove of immense importance to this company, which is raising a large quantity of coal at a slight profit. Newport Abercrombie close the week at 4 to 4 $\frac{1}{2}$ ; Cakemore, 4 to 4 $\frac{1}{2}$ ; Consett Iron, 17 to 17 $\frac{1}{2}$ ; Thorp's Gawber Hall, 2 to 2 $\frac{1}{2}$ ; Benhar, 8 to 9; and New Sharlston, 3 to 3 $\frac{1}{2}$ .

At the Swansea Ticketing, on Tuesday, 2059 tons of copper ore were sold, realising 86322.0s. 6d. The particulars of the sale were—Average standard for 9 per cent. produce, 824.4s. 5d.; average produce, 74; average price per ton, 41.3s. 10d.; quantity of fine copper, 154 tons 16 cwt. The following are the particulars of the two last sales:—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Per cent.	Per copper.
Nov. 6	2180	82	18	7	7	1	8
Nov. 13	2059	82	4	5	7	4	3

Compared with the last sale, the decline has been in the standard 14s., and in the price per ton of ore about 1s. 1d. The Betts Cove ore, of 8 $\frac{1}{2}$  produce, realised 11s. 24d. per unit; Caverna, produce 6 11-16, per unit 11s. 04d.; Aljustrel, produce 4 $\frac{1}{2}$ , per unit 10s. 33d. There will be no sale on Dec. 4.

Mr. R. C. Preston, secretary of the Cornwall Minerals Railway Company, requests us to publish the following statement, in rectification of some erroneous statements relating to the arrangement under which the Great Western Railway Company are working the Cornwall Minerals Railway:—The Cornwall Minerals Railway is being worked by the Great Western Railway Company under the terms of the agreement scheduled to the Cornwall Minerals Railway Act of last

session. This agreement, which is for 999 years, dates from Oct. 1, and secures to the Cornwall Minerals Company the working of their line at a cost not to exceed the percentage of gross receipts at which the system of the Great Western Company is from time to time worked, and the latter company guarantee to the Cornwall Minerals Company a minimum net income commencing at 15,000l. for the first year, and increasing annually until it reaches 18,800l. a year, which will cover the interest on the debenture and rent charge stocks.

The Rio Tinto Company announce that at the fourth half-yearly drawing of the 7 per cent. Bonds, to take place on Dec. 1 at the Credit Industriel, Paris, 720 bonds of 20l. each will be drawn for payment on Jan. 1.

A petition for winding-up the Bonville Court Coal and Iron Company (Limited) is to be heard before Vice-Chancellor Hall on Nov. 30.

Messrs. R. Eaton James and Co., public accountants, Moorgate-street Buildings, announce that they have taken into partnership Mr. J. Hills Blake and Mr. H. F. Knight (the latter for some years one of their managing clerks).

Mr. W. C. Cooper, of King's Arms yard, public accountant, has been appointed liquidator of the Government Security Fire Insurance Company.

Messrs. G. Bailey Toms and Co., of Laurence Pountney-hill, London, have been appointed sole agents for the export branch of the business of Messrs. John Bagnall and Sons (Limited), of Gold's Hill Ironworks, West Bromwich.

SCOTTISH AUSTRALIAN.—At the meeting of shareholders held to-day (Mr. A. W. Young, M.P., in the chair) the report of the directors was adopted. We have a report of the proceedings, which will appear next week.

PATELEY BRIDGE LEAD AND SMELTING COMPANY.—VALUABLE DISCOVERY.—The discovery made at this mine is regarded by those in the district as the most valuable made for many years. This week's official report says that the lode maintains its size and productiveness, being 8 ft. wide—a splendid course of lead ore, worth 6 tons per fathom; 20 tons have been dressed from this end alone within the past three weeks: 15 fathoms in advance of the present eastern end the level (30 fms. under adit, and the deepest point of operation) will enter into whole ground up to surface, which is believed to contain large deposits of lead ore. In the same level west the lode is 6 ft. wide, carrying a solid rib of ore 2 in. thick. In 8 fms. this end will be under the No. 1 winze, where there is a course of ore standing worth 2 tons per fathom. The other lodes are yielding an aggregate of 5 tons of ore per fathom. Smelting is proceeding regularly. This grand old mine is at length fully re-establishing its former enviable character.

WEST PATELEY (Lead).—The discovery reported last week opens out most satisfactorily. It is officially announced that the leader ore-bearing part in the 20 east, in No. 2 shaft, is worth 20l. per fathom, and in the same level west fully 18l. per fathom. The other lodes maintain for a long time past. The winding-engine will be at work by the end of the year. Dressing of ore is progressing. West Pateley will soon prove to be no mean neighbour to the famed Grassington.

LIVINGSTONE CONSOLS.—This mine has been inspected by Capt. Davey, of Wheel Killy (St. Agnes), Nancarrow of Camborne, and White of Wheal Pevor. The reports are of an exceedingly favourable description, and will probably appear in print at an early date. It is anticipated that quick returns can be made on a very small outlay.

NORTH CORNWALL.—In the south part of the sett there is every prospect of a considerable improvement. It is in the part opposite to that in which the engine shaft has been sunk; but, taking the sett as a whole, it is likely to become one of considerable importance. The lode on the Colquhite side, and which will be open to view when the shaft is unwatered, is acknowledged to be of a very superior description.

NEW TINCROFT.—This property was inspected some short time since by Capt. Josiah Thomas and William Rosewarne. Their reports were of such a character as to give the shareholders considerable confidence in the future of the property. The work now being done is by tributaries, but operations will probably be extended to the Gilbert part of the sett, which presents a field for mining rarely to be met with. The shareholders appear to be better satisfied with their prospects than they have been for a very long time.

## ZINC ORES.

### ARMAND FALLIZE.

INGENIEUR-CIVIL, A LIEGE (BELGIUM),

BUYER

- 1.—CARBONATED AND OXYDED ZINC ORES (CALAMINE, &c.)
- 2.—ZINC AND LEAD ORES MIXED TOGETHER, BUT DRESSABLE KINDS ONLY

## CAPPER PASS AND SON, BRISTOL

PURCHASERS OF

LEAD ASHES, LEAD SLAGS, SULPHATE OF LEAD, HARD LEAD, BRASS SLAGS AND ASHES, COPPER REGULUS, MATTE, SCORIA, TIN ASHES, TERNE ASHES, &c., and MIXED ORES or REFUSE, containing LEAD, COPPER, TIN, or ANTIMONY.

## ORE DRESSING.

MR. T. CURRIE GREGORY, C.E., F.G.S., AND MINING ENGINEER,

OF 4, WEST REGENT STREET, GLASGOW, AND 52, QUEEN VICTORIA STREET, LONDON.

May be personally consulted in LONDON on all matters connected with Ore Dressing and Rock Drills, to which he has for years paid special attention.

Estimates given, and all kinds of Machinery supplied.

REPORTS AND SURVEYS OF ALL MINING PROPERTIES MADE.

## MR. W. MARLBOROUGH, STOCK AND SHARE DEALER.

29, BISHOPSGATE STREET, LONDON, E.C. (Established 21 Years), can sell the following SHARES, at prices annexed:—

100 Almaden, 6s.	75 Exchequer, 5s. 6d.	30 Pandora, 17s. 6d.
20 Argentine, 42 12s.	25 Frontino, 43 2s. 6d.	10 Pateley Bridge, 44 1 3
100 Aberdunant, 15	20 Flagstaff, 42 10s.	40 Parys Mountain, 10s. 9d.
15 Almaden, 6s.	25 Goredale and Merlyn, 45 3s. 9d.	75 Penrith, 15s. 9d.
50 Bodidris, 41 2s. 6d.	20 Glenroy, 18s.	25 Port Phillip, 13s.
25 Bodidris, 41 2s. 6d.	20 Hultafall, 25s.	25 Rookhope, 41 6s. 6d.
50 Combarn, 4s. 9d.	20 Hingston, 10s.	15 Richmond, 29 1s. 3d.
50 Cornhill, 42 7s.	20 Last Chance, 17s. 9d.	10 Roman Grav., 48s.
25 Colorado, 42 3s. 9d.	25 Llanwrst, 42 17s. 6d.	80 S. Roman Grav., 9s. 3
60 Chontales, 10s.	20 Leadhills, 42 17s. 6d.	15 Tankerville, 45
50 Cape Copper, 42 23s.	20 N. Quebrada, 42 10s.	50 Teocoma, 5s. 9d.
20 Chicago, 42 12s. 6d.	40 Nth. Laxey, 10s. 3d.	10 The Lovell, 42 10s.
20 Don Pedro, 9s. 6d.	25 New Zealand Kap., 41 5s.	30 Van Consols, 8s. 9d.
25 East Lovell, 41	25 Marke Valley, 17s. 6d.	10 W. Craven Moor, 47 10
10 East Van, 44 10s.	30 Minera, 41 10s.	15 W. Wye Valley.
20 Devon Consols, 42 15s.	20 Monydd Gordan, 40	20 West Pateley Bridge.
20 Derwent, 42	10 Penant, 45.	40 W. Tankerville, 16s.
10 Eberhardt, 47 1s. 8d.	10 Pestana, 6s. 6d.	40 W. Goldolphin, 41 16s.
100 Penrith, 15	50 Rookhope, 45	call p.d.
100 Parys Mountain, 15	250 Tyn-y-Fron, 150	20 York Peninsula, 5s. 9

Shares bought and sold at net prices. Telegrams promptly attended to.

## FOR SALE, THE WHOLE OR PART, BELOW QUOTED PRICES:—

100 Aberdunant, 15	100 Cambrian, 10	60 Llanwrst, 45
50 Bodidris, 41	10 Roman Gravel, 10	30 Grogwinion, 10
10 Cook's Kitchen, 60	10 South Cwmdurow, 10	20 Goredale and Merlyn, 45
50 Lead Hill, 40	30 Tankerville, 45	5 Llanwrst, 45
100 Penrith, 15	50 Rookhope, 45	2 West Tolguis, 10
100 Parys Mountain, 15	250 Tyn-y-Fron, 150	150 Van Consols, 8s. 9d.

\* Specially recommended for a great rise.

Address, H. WILKINS, 3, Hayneville Villas, Tottenham, N.E.

## MR. GEORGE BUDGE, STOCK AND SHARE DEALER

4, ROYAL EXCHANGE BUILDINGS, LONDON, E.C. (Established 27 years), has SPECIAL BUSINESS in—Caron, Dolcoath, Carn Brea, Wye Valley, Van, Grogwinion, West Craven Moor, Great Laxey, Roman Gravel, Llanwrst, Allfami Colliery, Devonport and Tiverton Brewery, Hultafall, Cambrian, Llanwrst, Exchequer, Parys Mountain, Holmshush, Cakemore Colliery, Bodidris, Chicago, Bedford United, Mynydd Gordan, Wheel Coates, Wheal Pevor, Prince of Wales, I.X.L., Chontales, Derwent, Great Holway, Improved Wood Pavement, Lisburne, Melanear, West Mostyn, and Halcorn Sack.

SPECIAL BUSINESS in Cambrian shares.

LIVINGSTONE CONSOLS.—Mr. BUDGE is prepared to receive applications for these Shares, which he believes will advance in price.

## MESSRS. HARLAND AND CO., STOCK AND SHARE DEALERS, 88, GREAT ST. HELEN'S, BISHOPSGATE STREET WITHIN, LONDON, E.C.



### Notices to Correspondents.

\* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be sent on receipt; it then forms an accumulating useful work of reference.

**OXIDE OF MANGANESE.**—Can any reader inform me where I can discover the commercial value of oxide of manganese ore, and the best method of refining it? Also, is at present prices lead ore containing 52 per cent. of lead valuable enough to be worked?—A. B.

**MINERALS IN FORMOSA.**—Will some correspondent kindly give me, through the Journal, some information as to what are the minerals or metals that have lately been discovered in the island of Formosa, and whether they are only worked by the English Government?—E. S.: Bideford.

**BISMUTH.**—Will any of your readers kindly inform me, through the Journal, what is the current price of Bismuth?—B.

**ARGENTIFEROUS COPPER ORES.**—If "G." (Paris) will be good enough to favour me with his address, I believe I can offer him copper ore of the class described at page 124, "Notices to Correspondents," of the Journal.—JAMES MURRAY: Victoria Parade, Torquay.

**SHARE DEALING.**—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broker through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

**IMPORTANT NOTICE.—REDUCTION OF POSTAGE ON THE "MINING JOURNAL."**—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the Mining Journal to many countries will be reduced to one fourth. Henceforth the subscription will be 17. 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxembourg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Servia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 17. 19s. (50 frs.)

**R. received.**—"Shareholder" (Wheat Uny)—"W. N."—"J. A."—"R. B. M."—"B. J." (Paris)—"Shareholder" (Wheat Grenville)—"Constant Reader" (Derby)—"Stannum" (Redruth)—"M. W."—"Old Subscriber" (Haverfordwest)—"G. H. J." Next week—"A. Roving Welshman" (Bangor): We could not insert such a letter: the allusions are far too personal for publication—"W. S."

## THE MINING JOURNAL.

### Railway and Commercial Gazette.

LONDON, NOVEMBER 24, 1877.

#### THE BLANTYRE EXPLOSION.

Conflicting as the evidence has been as to the cause of the explosion at the Blantyre Colliery, there has been sufficient to show great laxity of supervision, a total neglect on the part of some of the subordinate officials in the carrying out of the provisions of the Mines Regulation Act, and great recklessness on all sides with respect to the use of gunpowder. Scotland has been comparatively free from explosions of fire damp, and that immunity has been taken advantage of in the working of collieries as if such a thing were really impossible. Gas was known to be given off at Blantyre, yet naked lights were used in all parts of it, even by the fireman, whose duty it was to go round the working places every morning and examine them for the purpose of seeing whether or not they were clear of gas, so that it is not surprising to find that the explosion took place shortly after those men had finished what they considered their duty. Those fire-tries, no doubt, were of the same opinion as Mr. DUNCAN, the manager of the Calder Ironworks, who, in his evidence, said that in the workings in Scotland generally very little fire-damp had been met with, and there were no collieries where safety-lamps were used exclusively—the Davy lamp, he considered, was the standard diameter for safety. Fortunately this is an opinion not shared in by our English colliery managers, otherwise explosions would be far more frequent than they are. But the views of Mr. DUNCAN on other matters, more especially with respect to fire-damp, are not shared in by greater authorities, for we find from the evidence of Mr. R. MOORE, the Inspector of Mines for the eastern district of Scotland, before the Select Committee of 1866, a statement exactly the opposite. The question put to him was—"You do not suffer much from fire-damp in your district, do you?" His answer was—"In Lanarkshire we have a great deal of fire-damp." He also admitted that there were badly ventilated mines in his district, remarking that in his report for 1863 he said—"I took occasion to notice what has been a prolific source of explosions, the very dangerous practice of driving fiery bords without brattice, and leaving them unventilated whilst standing up-stoop; up-stoop means driven up 15 yards, perhaps waiting until an end comes across upon it."

We, therefore, find that Mr. DUNCAN'S late evidence is in direct opposition to that given some years since by the Government Inspector for that division of Scotland in which the Blantyre Colliery is included; and there is every reason to believe that what the former stated as his belief is also that of some managers, and most of the overmen and fire-tries, and hence the recklessness which there is very little doubt led to the explosion with such fatal results. That this is a fair inference we have only to believe a portion of the evidence given by some of those men themselves, as well as that of the ordinary workmen. ALEXANDER WOOD, a fireman, said that on the side of the pit he had to examine all open lights were used, as well as powder. With regard to the latter, the Act of Parliament appears to have been openly set at defiance, for powder was taken into the workings in flasks instead of in cartridges, and the shots were fired indiscriminately by the men. This was first admitted by a fireman named JOHN LITTLE, although it was pointed out to the witness by Mr. DICKINSON that, according to Rule 8, powder should not be taken into the mine or be in the possession of any person except in cartridges. The witness also admitted that the ordinary work people were not sent out of the mine when the shots were fired, as required by the same rule, during three months after any inflammable gas had been found in a mine. LITTLE, however, was not convinced of the necessity of this being done, for he replied that—"Although there was gas in the place, there was no gas to do any damage and prevent the men from using the powder themselves." Surely when such a man is placed in a position of trust and responsibility in a colliery where gas has been met with daily, and whose duty it is to protect the lives of hundreds of men, it is no wonder that an explosion took place, with all its dire and terrible consequences. Further, this man admitted that he had formerly been employed as fireman at the Greenfield Colliery, where naked lights were used. At that place there were two accidents from explosions of fire-damp, one of them resulting in the death of two men, and they both occurred in that part of the pit in which he was fireman.

Four other firemen were also examined, and they stated that on several occasions they had found gas in the mine, but they considered it too trifling to report. They also confessed that they were not at all acquainted with the regulations of the Act of Parliament, and these were the men on whose ability and diligence the lives of some hundreds of workers depended. Here, at least, we have evidence not only of ignorance but of incapacity and thoughtlessness, and there is no reason to believe otherwise than that these officials have told the truth, seeing that it was so much against them; but the evidence of several of the workmen went a great deal further, and we do not see why it should be disbelieved. WILLIAM EADIE, whose father had been killed by the explosion, spoke as to the opinion his father had of the mine before others had told him that there was not a competent fireman in the place, and had told GILMOUR, the underman, of their incompetency, when he replied that he could not ask a competent man to take the position for the small wages. A man named McNULTY spoke to the state of the mine some time previous to the accident. He stated that about three months before the sad occurrence he was in the pit with his brother JOSEPH, who had a contract for working at the stoops, and was using a naked light. Whilst they were so employed the gas exploded, and his brother was so severely injured that he died a few hours afterwards. A roadman named JOHN SHARP said he believed that the men provided their own powder, and that a paper squib was used to fire shots. It was also asserted that GILMOUR had been

frequently informed of gas being in considerable quantities where the men were working, but he only swore at those who told him, and said there was no fear. But many of the men were really afraid, and one of them, DOUGHERTY, said they were afraid something would happen in the stoops, and he was not much astonished when he heard at last that it did happen. Another witness took the matter a good deal farther, and being a pit-head man he spoke from his own knowledge, for he said that the fire-tries on the morning of the explosion were later going down than usual; their regular hour was 4 o'clock, but they were 40 minutes late. They were usually a "wee bit late on Mondays," a by no means insignificant fact as to their capability for properly examining the workings of a mine, and carefully seeking for the presence of gas. That the latter was plentiful the men appear to be agreed, and to a dangerous extent, for one of them, JOHN NEILL, stated that blasting went on every day, the men purchasing their own powder and firing their own shots, without anyone interfering. He had seen gas kindling on the top after a shot had been fired. The firemen knew there was gas, and told them to wait it out with their waistcoats or bannets, for they could not put it out. This witness saved his life by having overslept himself on the morning of the explosion. This evidence was corroborated by a man named COULDER, who also stated that there was no discipline in the pit, and that if he went to the bottom and reported that there was gas he would sometimes be told to go to —, for it was a general rule to get through the work by swearing, and no redress was obtained when a complaint was made.

Other evidence of a similar character was given for the purpose of showing that gas was known to be in the pit to a serious extent by the firemen and the overman, but it did not transpire that this had been communicated to Mr. WATSON, the certificated manager, otherwise we cannot but believe that he would at once have taken steps to see that the ventilation was sufficient to clear it away.

As to the cause of the explosion from a point opposite to that entertained by the men, Mr. AUSTIN, a coal master, gave evidence on Tuesday, and he gave it as his opinion that it resulted from a sudden interrupted of the air course, which might have been caused by a fall from the roof, or a break down of the stoops. But the fact still remains that there was an accumulation of gas sufficient to cause an explosion, no matter what the cause. Mr. WATSON, the manager, also gave evidence, and said no complaint had ever been made to him of insufficiency of air. After the explosion in which McNULTY was killed he gave orders that only gauze lamps were to be used; and some time after that event he gave instructions that gunpowder should not be used, and so far as he knew these instructions were never departed from. He had been told that there was a little gas being made in the roof, but it was nothing to speak of, but never heard of them being told to wait the gas out, or he would not have allowed it. GILMOUR, the overman, was recommended to him as an excellent man. It is, however, very plain that Mr. WATSON placed too much confidence in GILMOUR and others, and that such confidence was greatly abused, and the result has been a fearful loss of life. No blame that we can see can be in any way attributed to the owners, the really culpable parties being those placed in authority at the bottom of the colliery, such as incompetent firemen, a careless and thoughtless overman, who allowed smoking, naked lights, the uncontrolled and open use of gunpowder to an unlimited extent, and the waiving of gas out with caps and coats. With all these dangers combined, and going on from day to day, the sure end of such a state of things in a colliery like that at Blantyre was that which took place—a terrible explosion, with great loss of life.

#### LIMITING THE OUTPUT OF COAL.

South Yorkshire, it seems, has been the first mining district to follow the advice of Mr. MACDONALD in attempting to cause an advance in the wages of the colliers by raising the price of coal, and so making it scarce. Anything more impracticable—or, in fact, insane—cannot be well conceived; and the result, so far, has been to make the poor simpletons who have attempted the impossible feat to take home less wages on Saturday than those at the surrounding collieries. In addition to this positive loss to them, they have also to answer a charge of not carrying out the agreement entered into with their employers. The Lundhill Colliery, where the experiment has been made, is one of the best known in the West Riding, and it may be said to have an historical reputation, for so far back as 1857 it was the scene at that period of the most serious colliery explosions recorded, when 189 persons were killed. The coal raised at it is the well-known Barnsley seam, rather more than 8 ft. in thickness, and being of a very good quality has been in such request as to lead to the men, as a rule, being very well employed. On the average, about 1500 tons per month of the coal goes to the London market; and, as the men know this, and, as in all probability, they have no clear idea as to the consumption of fuel in the Metropolis, they may have thought they could make it so scarce that prices would jump up sharply by the action they had taken. But, so far from there being any scarcity of coal in London, the complaints now are that it is far too plentiful, so that prices are fully as low as they were during the summer, and there would be very little difference if half the pits in South Yorkshire were entirely closed, seeing that not only in the North of England, but in other parts of the kingdom as well, a large body of coal-getters are either altogether standing or only partially employed. The owners of Lundhill Colliery, however, have shown that they do not intend to allow their workpeople to dictate to them what quantity of coal is to be raised, or how it is to be disposed of, and so on Saturday summonses were taken out against upwards of 130 of them for a breach of contract, and the charges were fixed to be heard at Barnsley, yesterday (Friday). This, it may be said, is the first time that the point as to whether the miners can get what quantity of coal they please or not will be decided. The men appear to be of opinion that so long as they remain eight hours in their working places it is immaterial what quantity of coal they send to bank; but if this is correct they would be justified in remaining below and getting no coal whatever. But there is every reason to believe that those who have taken such an unusual course, without any notice, will find they have made a very great mistake, and that the law is far more powerful than the voice of one of their leaders, although he chances to be a member of Parliament.

That it is necessary for prompt action being taken to bring the issue to as speedy a conclusion as possible is evident, for we find that at the Manners Main Colliery, only a short distance from Lund Hill, a meeting was held, when a vote of thanks was passed to Mr. MACDONALD by the miners, who pledged themselves to give him all possible support in carrying out his views with respect to keeping the coal markets from being overstocked, and so enabling, as they say, the masters to sell at a reasonable price, and thus be able to pay a fair day's wages to the men. The vision of these poor dupes must be limited indeed if they think it possible that all other trades would willingly be taxed, were that possible, solely to keep miners' wages up. They do not seem to be sufficiently acute to see that it is the cheapness of coal that keeps up almost every description of our manufactures at the present rate of production, limited as it is, and that to advance the price of it would lead to greater depression in the several trades of the country than now exists. But assuming for a moment that the wishes of the men were carried out, they could not fairly deny the right of other workmen to carry out the same principle, and so lead to a corresponding increase in the cost of every necessary commodity. The miner would then find that in his selfish endavour to benefit himself he had drawn a blank, and was "hoist on his own petard." As things are at present, if the workmen at our collieries are dissatisfied with their position in any one district, they have only to give notice and leave like honourable men, and go where they please; but to suppose for a moment that their employers will tamely submit to allow them to do as they please with their property is too preposterous to be entertained. The question at issue is an important one, and it is well that it is raised whilst comparatively few men have taken upon themselves to act upon the advice of one who, in our opinion, either from vanity or some similar cause, desires to show what power he has over the colliers in some localities, by holding out to them expectations that it is impossible to realise.

So far, the miners who have commenced the "limitation" movement have been the principal sufferers, and will be still further so, consideration, but on the suggestion of one who has not to labour with them for a living, endeavours to carry out what every thinking man cannot fail to see is an impracticable idea.

#### CHEAP AUSTRALIAN RAILWAYS.

There is one circumstance which appears to us to be of very considerable importance in connection with the future development of Australian railways. We refer to the remarkable cheapness with which certain lines in Queensland are now being carried out. When the Victorian Government first undertook the construction of railways in 1853 they proved very costly works, having involved an outlay of somewhere about 30,000,000 per mile. Moreover, these ventures bearing the severe interest of 6 per cent. per annum. Now both the Victorian and the Queensland Governments—and for the matter of that the treasuries of New South Wales and South Australia also—can borrow money on the security of their debentures at a trifle over 4 per cent. per annum, and the cost of constructing new lines has fallen to 5000,000 per mile, or thereabouts. An illustration of the extreme cheapness with which some of the new Australian lines are being constructed is afforded by a statement recently made in the Queensland House of Assembly by the Premier of that colony. Thus the Queensland Prime Minister stated that the extension of the Western line now under construction from Dulacca would scarcely cost more than 4300,000 per mile, and he saw no reason why that rate should be greatly exceeded in the further extension of the line and in other new lines in contemplation. The Minister proceeded to state that the Stanthorpe extension was estimated to cost 8553,000 per mile, exclusive of rolling stock and purchase of land. The Maryborough and Gympie line would cost about 5127,000 per mile; the Bundaberg and Mount Perry would also be a cheap line; and as regards a section from Bundaberg to New Mounts it was estimated that the cost need not exceed 3050,000 per mile, although there would be a tunnel in the course of the last four miles.

It appears to us that these data are of considerable interest to the British iron trade. Australia is a region of enormous distances, and it affords a vast field for the energies of the railway engineer. But the great difficulty which, of course, confronts the projectors of all new Australian lines is the necessity of providing an interest upon the capital devoted to their construction. Where population is scanty, and the distances which have to be overcome are considerable, it is not very easy to realise large profits, hence the extreme importance of restricting the outlay of capital within the narrowest possible limits. The Queensland Government and the neighbouring Australian Governments have thoroughly appreciated this fact, and have enforced the most severe economy in the railway construction works which they have on hand. The result is that the new Australian lines, while they will serve as feeders to those already in operation, will entail comparatively light burthens—if, indeed, they entail any burthens at all—upon the Australian treasuries. This being the case, the work of future railway construction must be greatly facilitated at the Antipodes, and the Australian demand for our railway iron will, under such circumstances, not only be maintained at its present cheering level, but it may very possibly increase. As we have remarked on more than one recent occasion, population and wealth are accumulating in our Antipodean dependencies at a rapid rate, the natural resources of vast wildernesses are being opened out, and industrial enterprises are expanding in all directions. The more generally and the more widely the iron horse can speed on his way in Australia, the more rapidly will the work of Australasian development proceed, and the more extensively this development takes place the better, of course, will it be for the over-crowded communities of the Old World. Not merely from a commercial but even from a social point of view, it is thus of great interest and much importance that the policy of cheap railway construction, now in fashion in Australasia, should be carried out to the utmost possible extent.

#### PROFITS OF SLATE QUARRIES.

TO THE EDITOR OF THE MINING JOURNAL.

SIR.—An advertisement of the Dyrin Slate Quarry appears in the Mining Journal for Nov. 10, in which it is asserted that I have made statements as to the profits realised by the slate quarries of North Wales. This assertion was first made many years since by a Welsh Slate Company, in a circular which had a wide circulation. When my attention was called to this, I made the company recall as many as possible of the circulars issued, and cancel the objectionable paragraph in all. Notwithstanding this, from time to time I have been greatly annoyed by the re-appearance of this incorrect statement. I have, therefore, no alternative but to ask you to allow me to assure your readers, in a prominent place in the Journal, that "I have never on any occasion ventured to make a statement relative to the profits obtained by working slate quarries."

Jermyn-street, Nov. 12.

ROBERT HUNT, F.R.S.,

Keeper of Mining Records.

**DISCOVERY OF IRON ORE IN FURNESS.**—Within the past few days the Furness Iron and Steel Company have discovered a valuable pocket of iron ore on their Goldmine royalty near Furness Abbey. They have pierced the metal in five distinct places, and have sunk to it with very satisfactory results. Its extent has not been ascertained. It is only a few weeks ago that the Sandale Mining Company found a large bed of metal at Sandale, and more recently Messrs. Kennedy Brothers have pierced a large pocket of the raw material on their Ronhead estates. These deposits are unquestionable indications of the unknown extent of the Furness iron mines. They give confidence to trade and shadow forth for the future the impossibility of running short of the raw material. Explorations are going on in different parts of Furness with a view of discovering other beds of metal, and the indications are hopeful.

**WINDING-UP LIMITED COMPANIES.**—Some significant remarks were made by the Master of the Rolls on Saturday in a case in which two creditors had petitioned for the winding-up of an insolvent limited company. His Lordship said he agreed with Lord Russell that it was impossible to allow every creditor to present a petition to wind up a company, for in that case the Court would not sit at 10 or 20, but 100 petitions in a single winding-up; and every solicitor who had a client who was a creditor, or who could find a person who was willing to become his client for the purpose of becoming a creditor, would get up a petition, and the costs, already so enormous, would be probably increased tenfold in the first stage of a winding-up, added to Lordship, there was no efficient control over costs.

**COAL AND IRON IN THE UNITED STATES.**—The demand for pig-iron has been moderate at New York, and has been confined to small lots for prompt delivery. The feeling in the New York market has been generally good, and favourite L-high brands have continued in short supply. There have been many enquiries for steel rails at New York; some of the rail-making companies are, however, so full of orders that for the present, so far as prompt delivery is concerned, they are practically out of the market. The low prices at which steel rails have been selling at New York have caused a demand for steel rails at Philadelphia, and several thousand tons have been placed at from \$40 to \$42 per ton currency at the mills. Some additional business is expected to be secured before the close of the month. The owners of mills, having secured sufficient orders to keep them fully employed for a considerable period, are less disposed to make concessions than they were some weeks since, although it is quite likely that large lots for cash might be had at low as ever. There have been large transactions in old rails, and the market has been firm and somewhat higher. The Reading Coal and Iron Company is about to dispatch 14,000 tons of new iron rails to Brazil. There has been a somewhat better demand for bar-iron at



Philadelphia. The Pennsylvania coal trade is brisk, and previous prices have been supported.

#### REPORT FROM CORNWALL.

Nov. 22.—Too much importance has been attached by many to the fluctuations in the tin standards which have been in operation since our last, though the official figures, according to the common rate now-a-days, remained unchanged. We need not stay to point out how unfair it is to a manager who takes his tin to the smelting-house on the faith of the official standards, and then is told he cannot have them. Some fluctuation was to be expected, but everything concurs in pointing to a fresh advance not far ahead. It is wisest, therefore, in the absence of special individual cause to the contrary, to hold one's hand just now, and wait, like Mr. Micawber, but with a better grounded hope, for what will turn up. The plucky policy is clearly the best one.

The special event of the week has certainly been the holding of the first Exhibition of the Mining Institute at Camborne, which opens to-day, and of which a full description will be found in another column. So far as the exhibition itself is concerned the success achieved has been very remarkable, and must be exceedingly gratifying to the energetic promoters. Whether it will be equally successful in a pecuniary point of view is a matter which as yet remains to be seen. We hope it may.

Cornwall has a fair share of new railway schemes to be brought before Parliament in the ensuing session, and some of them at any rate should have a beneficial effect on mining. The Great Western Company has now taken the Liskeard and Caradon Railway under its auspices, and intends to convert it into a passenger line, with an extension into Liskeard Station, taking powers also to lay down on narrow-gauge rails. The line thus worked by the Great Western, in conjunction with the Cornwall Railway, will open up to passenger railway communication the town and harbour of Looe on the one hand, and on the other the Caradon district, with its most important range of mines. At present only goods trains are run. The acquisition of this line by the Great Western may materially affect the plans of those who are promoting a narrow-gauge line into Cornwall, via Gunnislake and Callington. Another Great Western Railway Bill is for the amalgamation of the South Devon with the Great Western system, and a third is very miscellaneous in its clauses. It proposes to authorise a short line connecting the Great Western line at Tiverton with the Tiverton and North Devon Railway, to extend to the Cornwall Minerals Railway to Tywardreath, to purchase lands and houses near the Saltash railway station, to widen the railway bridge at the northern end of Tavistock station, and to purchase lands thereabout, and to acquire additional lands near Gwinear Road and Marazion railway stations. The extension of the Cornwall Minerals Railway to a junction with the Cornwall line near the Par station is a very important matter, though the works involved need not be costly. We presume we shall soon have passenger trains running from Lostwithiel to Fowey down the river line, which would be a great convenience.

So far as Devon is concerned, the new railway schemes are not numerous, nor can they be said to be, with one exception, of any great importance. About fifty years ago a railway was made from Plymouth to the King Tor Granite Quarries, on Dartmoor, near Princetown, but it has never done much work, and is now practically idle. This line it is now intended to convert to passenger purposes as a part of the Great Western system, and its reconstruction may have some effect on the mineral industry of the mine if the present scheme does not share the fate of several predecessors. It is likewise proposed to complete the long-delayed Teign Valley line by carrying it to Exeter at one end and Chagford on the other. There are valuable metalliferous lodes in this locality which the completion of such a line would aid greatly to develop.

We are glad to hear from several quarters a good account of the prospects of several new enterprises—more particularly in Devon, in connection with the lead mines there. Since the unfortunate sinking in of the Tamar into the great silver-lead mines at Beer and mining in Devon has been very quiet, and very little work of permanent character has been done. Now, however, we have not only the once famous Combe Martin Mines in a fair way to become active again, but very promising work is being done in lodes in other districts.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Nov. 21.—Passing through the Llanrwst district the other day, I found the lead miners a little elated by one or two good discoveries made lately. Some of these it is hoped may at last lead one of the mines of that region into a profitable condition. The miners engaged at the East Pant Ddu, Black Mountain, and Belgrave Lead Mines, near Mold, have presented Captain William Roberts with a valuable gold watch and chain, "in appreciation of his skill and judgment in discovering one of the finest veins of lead found in the district for years, and thus finding employment for a large number of men." The spirited owners of the Cwm Dwyfor Mine, near Carnarvon, have met with a little disappointment recently in the splitting up of their lode. It is to be hoped, however, that this derangement is but temporary, and that when the branches again unite the result will be a good body of lead ore.

As a rule, the collieries report increased trade, though the prices are low. The Ruabon Coal Company have made an advance of 6d. a ton, but it remains to be seen whether or not this advance can be maintained. The Oswestry Brick and Coal Company, who have been engaged for some time past in widening and deepening the shafts of the Drill Colliery, have just struck a 4-ft. seam of coal of excellent quality for steam and lime purposes. This seam underlies the old workings of the colliery, and will, it is expected, remain intact under the whole of the company's property. The Panty Colliery, near Wrexham, completed last week its branch line to the Great Western Railway, and openings are being pushed forward in the main coal, which, in excellent condition, was won this year. Some of the collieries lying to the deep of the Mersey pits are suffering from an influx of water through the cessation of pumping at that colliery. The Brymbo owners are, however, willing to continue the pumping if paid a reasonable sum for doing so, they having no occasion to pump for their own purposes.

It is, however, very desirable that either a suitable pumping station with sufficient power be established or that, as has been before now contemplated, a deep level were driven from the River Alyn, either of which would be available for the unwatering of the whole of this important portion of the North Wales coal field. The pits at the Panty Colliery at Plas Power are reaching the main coal. The whole of these works are of the most approved character, and are adapted to a very large output of coal. They are under the immediate superintendence of Mr. R. N. Griffith, F.G.S. A fatal accident occurred in the new winning at Gatewen on the 15th inst. A sinker prepared a blast, and was ascending the pit out of the way, when some mischance he fell out of the bow of the exploding shot, and was killed instantaneously. At various collieries, from Presbury on the south to Mostyn on the north, preparations are being made for the requirements of the hoped-for revival of trade. Most of the small ironworks of the district are now closed, and some of them broken up, while the larger ones with their limited production are in a very forlorn aspect. North Wales seems to take the lead in the manufacture of fire-bricks and other fire-clay products; this supply keeps good, orders are plentiful, and prices satisfactory. The Shropshire Union Railway and Canal Company are applying for powers to substitute steam for horse-power in the towing of the Glyn Valley Tramway, and also to extend the line to a new stone quarry worked in the felspathic rocks above Llanidloes, and also the paving sett quarry which has recently been opened in the greenstone bed of Pont-y-Meilion. A branch line to connect the Nantyr Slate Quarry with the tramway at the works of the Deirw Valley, and the extension will run close to the works of the Patent Gunpowder Company. This company, which has an establishment in the valley, in 1873, has not been successful in the manufacture of its speciality, and it seems necessary for it to

undergo a process of reconstruction. Its licence, I believe, includes the manufacture of black powder and other explosives, and it is to be hoped that its works, which were excellently laid out by an able engineer, may be profitably utilised in other directions than that to which they have hitherto been confined. Before this little tramway is complete, and as useful and profitable as it may be made to be, a junction must be effected with the Great Western Railway near Chirk, and the line carried up the valley to the now unworked slate rocks above Llanarmon. Power to substitute steam for horses is also to be asked for the Wrexham district tramways, which connect the mining district of Rhos with the town of Wrexham. Here, again, a junction should be effected with the Great Western Railway. As a backward step, the Birkenhead, North Wales, and Stafford Railway, which was to have done much for the mineral trade of the district, is to be abandoned.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Nov. 22.—The Coal Trade is without much alteration upon the week. Sales of both furnace and forge sorts are under the average, and most of the collieries are making short time. Certain of the miners in the Darlaston and West Bromwich districts have followed the action of the Sandwell Park Company's men in giving notice for an advance of 1s. per day in wages, but the movement is not looked upon as of any moment. The pig-iron trade rules dull. Some 50 furnaces are now in blast, and owners are even yet unable to rid themselves of their heavy stocks. There is not less activity at the mills and forges than at the date of my last, and prices remain without quotable change.

The local stock markets do not exhibit any improvement. The property of the Hamstead Colliery Company has sold at 7 dis. The shares of the Chillingham Iron Company have changed hands at 34. 10s. Muntz's Metal Company has secured 2½ premium; the Patent Nut and Bolt Company, 7 premium; and the Staffordshire Wheel and Axle Company, 1½ premium. The Cannock and Huntington Colliery shares are quoted by holders at 5½ dis., but at this figure no buyers appear. Sellers in the West Cannock Colliery are asking 2½ premium for their 80s. shares, but without success. The property of Joseph Wright and Co. (anchor makers) is quoted by sellers at 1 prem., but purchasers hold back. There have been transactions in the Tankerville Mine (Limited) at par.

An important arbitration case, which lasted four days, has just been concluded at Dudley, before Mr. William North, mining engineer. Mr. Hickman, coalmaster at The Delph, sought to recover 955s. from Mr. Pearson, colliery owner at the same place. The mines adjoin each other, and the plaintiff alleged that in 1874-5 the defendant encroached on his property in two places, and took therefrom about 500 yards of coal, worth 955s. The plaintiff called witnesses who were formerly in the employ of defendant, who swore that Mr. Jeremiah Skidmore, the defendant's mine agent, ordered them on one occasion to hide an encroachment as the plaintiff's surveyor was going down the pit to inspect, and that when after much delay he did at last go down, Mr. Skidmore concealed a magnet in his waistcoat pocket to throw the surveyor's dial out of the north, and thereby make it appear that a certain portion of the mine being worked was within the defendant's boundary. Mr. Skidmore, called for the defendants, emphatically denied the use of the magnet, but admitted a slight encroachment at one point, due to the coal overhanging, and estimated the damage thereby occasioned at 30s. The defendants alleged that this was the only encroachment. A great deal of scientific evidence was given on each side. The arbitrator, as a matter of course, reserved his decision.

A verdict of "Accidental Death" was returned on Monday at the inquest upon the bodies of the two miners who, on the 10th inst., were killed by a fall of coal in the Prince of Wales pit, near Dudley, but the jury censured the doggy for not using timber. A "bump" had occurred, and had brought down a piece of the veins 6 yards long, 1 to 1½ ft. thick, and 6 ft. wide. It was overhanging coal, but no timber had been set, for "as the coal knocked sound" the place was considered safe.

In North Staffordshire coal of all descriptions is very plentiful, notwithstanding that at certain of the collieries the men are still on strike. During the week many of the discontented have given up the contest, and gone in at the drop, but around Longton the men show a strong disposition to stay out as long as possible. Prices are without alteration. Domestic coal is less in demand than is usual at this season of the year. The pig and finished iron trades are very dull. Orders are difficult to obtain, and prices are fluctuating.

A charge of intimidation arising out of the North Staffordshire strike has been brought before the local magistrates, and adjourned. It is said that the case will assume a very serious form, about thirty colliers on strike having followed the complainant, and threatened to drown him, a threat which it was actually attempted to carry out.

#### REPORT FROM THE NORTH OF ENGLAND.

Nov. 22.—So far as the Iron Trade of the Cleveland district is concerned, a movement has been inaugurated this week that is likely to be attended with important consequences in the time to come. The pig-iron makers of the district held a meeting on Monday, and concluded that henceforth they would all sell their stuff at the same uniform price, which price was fixed for the present at fully 1s. per ton above the rates current in the previous week. This step is held to be justified by the fact that the stocks in makers' hands have recently been diminishing, while the quantity of iron produced is less than it has been for some time. The project is one of a novel character, so far as Teesside is concerned. It will, probably be easy to bind the large and more wealthy firms to strict compliance, but there are a number of small and needy concerns who are obliged in times like these to live from hand to mouth, and on whom, therefore, the compulsion involved in this arrangement would press with much severity. There is, however, a disposition apparent to adhere to the terms agreed upon at Monday's meeting, and although consumers resented the change by refusing to buy iron as far as they could do so, there is much probability that the makers, if firm, will ultimately carry their point. The quotations agreed upon by makers' were 41s. per ton for No. 3, and 40s. for No. 4 forge, less 1 per cent. commission. Business was done on Tuesday in some cases at less than these figures, but if the chief makers adhere to the rates they have decided upon the bulk of the business must pass through their hands. The returns of the Ironmasters' Association for the month of November are expected to show a large increase in shipments, the export trade having been very brisk for the past fortnight. The production of pig-iron, however, is believed to be less than it has been at any time this year. The finished iron trade keeps up the apprehensions of the past year as to its future. Plates for shipbuilding purposes are in tolerably good request; but considering the extent to which steel is now being applied, even in shipbuilding, and the tendencies exhibited by the Board of Trade, by Lloyd's, by the Admiralty, and by others concerned to adopt it more largely in lieu of iron, plate manufacturers cannot be said to lie quite on a bed of roses. They have now their order-books tolerably well filled, but the plate trade of Cleveland may disappear as suddenly and as completely as its rail trade has done, and manufacturers cannot shut their eyes to such a possibility. Meanwhile, however, steel plates are far from coming within competitive range of iron plates in the matter of price, and until this distance has been diminished the substitution of the one material for the other will not be so remarkably sudden as it otherwise might be. The Consett Company, the Skerne Iron Company, Fox, Heald, and Co., and Bolckow, Vaughan, and Co. are pretty well furnished with orders for ship-plates, but there are not many new contracts being placed.

The Tees Conservancy Commissioners have raised the ire of the iron manufacturers, mineowners, &c., on the Tees by proposing to increase the dues to enable them to carry out further improvements on that river, involving a cost of over 326,000l. The Commissioners were soundly rated at a conference held on Monday for attempting to increase the river dues at a time of such depression as the present. It is not known what the result of the conference will be.

A question of assessment of some interest to mine-owners came before the Whitby guardians last Saturday. Mr. Palmer, M.P., on

behalf of Palmer's Iron and Shipbuilding Company, applied to have the assessment of the company's mines at Hinderwell, in Cleveland, reduced from 1210l. to 994l., the latter being the equivalent, at 4d. per ton, of the 59,000 tons of ore raised from the company's mines in the year ending June, 1877. The committee of assessment have agreed to the application.

At the Philadelphia Colliery, belonging to the Earl of Durham, a new engine has just been applied successfully to doing the work of ponies and putters in bringing the tubs out of the underground workings of the mine. The engine is the joint invention of Mr. Lishman, Lord Durham's managing viewer, and Mr. Young, the engineer.

The Durham Miners' Association has issued a manifesto, from which it appears that it is in a rather bad way. Very strong phrases and statements are made use of, one of which has called forth a retort from Mr. Bunning, the secretary of the Owners' Association.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Nov. 22.—The improvement noted last week in the Iron Trade continues, and the prospects for the winter do not now wear that gloomy aspect which they did some time ago. Some fair orders, both of iron and steel, have within the last few days been lodged in the district; amongst other places, at Dowlais and Ebbw Vale. There is also a revival of business at Briton Ferry, both in the iron and tin-plate departments. It is probable, too, that better news may shortly be heard of Plymouth and Abernant. The clearances of iron during the week have not been quite so large, but include parcels of rails to India and Brazil. All shipments to the Northern ports are over for the season. The great complaint of manufacturers now is the lowness of prices, and it is evident that wages must be further reduced. The merchant iron department is not quite so active, but prices have not materially changed. The pig-iron trade may best be described as stationary. At the steelworks there continues to be a fair amount of business doing. Tin-plates are a dull sale, but there appears to be a slight impetus given to the foreign demand.

The Coal Trade has not materially changed. There is the same falling off observable in the demand for coal for foreign exportation, but freights appear to be firmer, and to exhibit an upward tendency. There is only a moderately good demand for steam coal, but the local consumption has to a slight extent increased, and house qualities are fairly well enquired for. The pit coal trade is still characterised by a certain amount of dullness, but shipments are maintained about up to recent averages. A delegate meeting of miners has been held at Aberdare, at which the Risca and Nant-y-Glo colliers' disputes were discussed, but the meeting was adjourned without any practical result being come to. A circular has been issued to the men asking them to contribute 6l. per head towards the costs of the Conciliation Board. They ought to do this with a good grace, for the result of the Board has been to retain wages at the same standard, while proprietors have been, it is well known, losing money.

It will be remembered that some time ago the wages of the colliers employed by the Nant-y-Glo and Blaenau Company were reduced 15 per cent. The men resisted this, and eventually they agreed to resume work on 10 per cent. being restored. It was resolved that after a certain time the other 5 per cent. should be taken into consideration. That time expired, and the men have been in dispute with their employers as to the restoration of the amount of reduction named. The directors declared that times were so bad that they could not afford to give more than the existing rate of wages, and now they have taken a decisive step, in consequence of the conduct of the men, and resolved to close the remaining pits. It is stated that these will not be re-opened unless the colliers accept a 20 per cent. reduction. This step will affect probably over 1000 men. The letting of other of the company's valuable property is under negotiation.

Further falls of debris have taken place at the Vale of Neath tunnel, and it is not probable that the traffic can be resumed for some weeks to come.

Among the parliamentary schemes to be promoted next session is one by the Alexandra Dock Company, who apply for power to extend their railway to a junction with the Brecon and Merthyr at Bassally.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

Nov. 22.—Reports from the lead mining districts of Derbyshire show that no great amount of business is being done, and that the production of ore contrasts most unfavourably with what was formerly the case. Many places that were opened out and very partially worked are now standing, but no one appears at all desirous of taking to them, although some of them, no doubt, would pay if opened out. At the collieries a steady trade has been done, and the men are now better employed than they have been during the year, and the Clay Cross Company have been sending a full average tonnage to the Metropolis. Work, however, has been entirely stopped at No. 4 colliery, owing to an inundation by a large body of water. At the time there were a great many of the miners at work, but all of them, fortunately, escaped unhurt. In steam coal there has been but little change, the mild and open weather favouring sales. From the southern part of the county a considerable tonnage of coal is being sent westward, where it is in fair request, even in localities where coal is raised. Burton and Ashby raise a considerable quantity of coal, one of the largest proprietors being Mr. A. Hastings, who married the late Countess of Loudoun, and whose daughter espoused the Duke of Norfolk on Wednesday. His Grace is one of our largest colliery owners, as well as the owner of a vast amount of property in Sheffield and the neighbourhood, being the proprietor in that district of 15,270 acres, the gross estimated rental of which is 231,354l. The Hastings family have also extensive estates in Leicestershire, Yorkshire, and Scotland. As a matter of course, great rejoicings have taken place on the estates of the two families, the workpeople not being overlooked, for all classes connected with the two families as workers and occupiers have taken a great deal of interest in the event.

In Sheffield one or two branches of trade look rather better, but the cry of slackness is all but general. Bessemer rails have in no way declined, and it would appear that as fast as orders are cleared out they are immediately replaced by others. The makers, therefore, are busy, and will, no doubt, continue so for some months to come. In ordinary rails there has been no improvement whatever, the orders in hand being but of limited extent. Very little is being done in heavy armour-plates, but there is a strong feeling that the new year will see a marked improvement for the better, for Sheffield has hitherto been the sole maker of the heavy plates for armour ships and land fortifications. Makers of cast steel still complain of the slackness, and, excepting for small deliveries of special quantities, very little is being done for ordinary forgings, such as shafts, piston-rods, motion-bars, &c. Some of the leading cutlery firms are doing more, not only for the colonies but for the home markets as well. The four trials are kept fairly going, but at few of them are the men in any way pushed, whilst at others it is as much as can be done to find full employment for them. Malleable iron and castings appear to be still in steady request, being one of those branches that is not so much affected by the general depression as most others in the town are, whilst the energy and skill of the leading firms are such as to lead to the material being adapted to several purposes for which more costly metal and workmanship were formerly used.

The Coal Trade of South Yorkshire has undergone but little change during the last week or two, there having been a tolerably fair demand for household qualities, and a larger tonnage than usual has been sent to London of Silkestones. Yet prices have remained not only without alteration to consumers, but are now lower than they were a couple of months ago. Yet with this fact before them, some of the miners wish to see what effect a limitation of the output would have. It has been tried at one colliery, and the result has been a marked limitation in the amount of wages paid, whilst the men are to be tried at Barnsley to-morrow for neglecting their work. At several of the recently opened out collieries active pre-



parations are being made for developing them, so that before long there will be a considerable increase in the output of coal in the South Yorkshire district, which is not calculated to increase prices or wages. At the Corton Wood Colliery, near Barnsley, the men have been on strike some three or four weeks, and a deputation of the men waited on the executive of the Coalowners' Association, at Sheffield, on Tuesday, but matters remain as they were. The dispute at the Silkstone Colliery at Dodsworth, which has now lasted upwards of seven months, still continues, and without any sign of its being brought to a close. A number of non-Unionists from a distance, it is said, have been engaged, and a large building at the pit has been fitted up for their accommodation for both bed and board, so that they cannot be molested by the old hands. The latter are strongly picketted around the colliery, and have succeeded in getting away a few men that were about to apply for work. But as the wages paid in South Yorkshire are about the highest of any mining district in the kingdom—and Dodsworth pays fully as high as any working the same seam—there is not likely to be much difficulty in obtaining plenty of hands so long as their safety from molestation can be assured, and that has been done as far as possible.

Mr. Mundella, M.P., speaking before the Sheffield Trades Council, ascribed the present depression of trade, which he held to be much exaggerated, to the fact that bankrupt and involved States to which English bondholders had lent money were now unable to keep up the demand, and the English capitalists who had lost principal and interest in foreign loans were compelled to retrench. Thus home and foreign markets were both affected. With the recovery of the States, and they were recovering fast, would come a revival of trade even more marked than had ever been known.

#### TRADE OF THE TYNE AND WEAR.

Nov. 21.—The Coal Trade continues in a deplorable state; at any rate, that for steam coal can only be so described; indeed, we do not recollect such a complete collapse—at any rate, within the past 20 years. The Walbottle Colliery—one of the oldest works in the south-west of Northumberland—has now been closed. A large quantity of fine house coal was worked here during many years, and shipped to London, but the coal has been partly worked out. A good deal of coal remains in the royalty, which is extensive—upwards of 3000 acres—but it cannot be worked profitably at present. Fire-clay of good quality is found here, and the manufacture of fire-bricks will be continued. The request of the officials of the Union in Northumberland that the men should contribute in future 5 per cent., or if necessary 7½ per cent., of their earnings has been keenly discussed by the men. The executive of the Union have, we imagine, in both counties entered on a most dangerous course when they undertook to support the men out of employment, and pay them shilling money from the funds at their disposal. The Union funds were not intended for this purpose. It is also evident that such payments would be liable to abuse, and such has, it appears, been experienced. It is certain that these payments must be largely reduced or relinquished altogether, or, on the other hand, the payments made by the men must be greatly increased. The prospects of the Union in Durham and Northumberland were never so bad since their last formation as at present, and if the burdens the men have to bear are continually increased in the shape of contributions to the Union funds, it is quite possible that these organisations may collapse. As it is, numbers of men have left the Union in both counties, and are now free from it. Men continue to remove from the district; a considerable number have gone to Scotland, some to the Midland districts, and others are also leaving for Australia and New Zealand. In Durham the trade is dull, yet a number of the works continue to make from eight to ten days per fortnight. The shipment of gas coals continues large, and the demand for house coal has improved a little during the past week. There is no change in the Coke Trade, and only very moderate prices are secured for this important article.

The foundries and engine works of the district continue, on the whole, very dull; orders are scarce—there are some exceptions, but this is the rule. At the great works of Sir W. Armstrong, Elswick, heavy orders have been secured, and there is much activity in many departments; but at most of the locomotive engine works there is a great dearth of orders. At Messrs. Stephens', and also Hawthorn Works, in Newcastle, there is comparatively little work on hand. Iron shipbuilding on the Tyne and Wear continues good—the vessels building are mainly steamers of large tonnage. A vessel is in course of construction at Mitchell's Yard, on the Tyne, of steel plates, and this is expected to be a great improvement on the ordinary iron-plates used. The finished iron trade continues dull. The failure of the iron rail trade has been a great misfortune in this district. At Consett, however, and other places also, some business is done in the manufacture of ship plates, and at the Teams, near Gateshead, a good business has now been established in making thin plates and sheets by Messrs. Cook and Hillman. The Chemical Trade has been extremely brisk lately, owing to the near approach of the close of the shipping season. No contracts have yet been made for next year's delivery—sellers are not anxious to make contracts unless present rates are increased, as little profit can be got at present rates.

#### THE IRON TRADE IN THE NORTH.

The use of the hematite iron of the Furness and West Cumberland districts for steel manufacture, and especially for the manufacture of steel rails, is giving to those districts immense advantages at the present time. At the period to which our latest official statistics bring us the production of the North-Western district compared as follows with that of the North-Eastern:—

	North-Eastern.	North-Western.
Iron ore produce .....	Tons 6,562,000	Tons 2,338,370
Pig-iron produce .....	2,034,185	950,871
Blast-furnaces erected .....	159	96
Blast-furnaces in blast .....	126	57

Since the period to which these figures refer there has been a considerable change in the position of the two great centres, and that change is on the whole favourable to the North-Western centre. The state of trade, the manner in which the demand for iron rails has fallen off, and the great aggregation of stocks in the hands of the Cleveland ironmasters have compelled the limitation of the output, and now the number of furnaces in blast in Cleveland and the North-East is but 110 out of a total of 160 erected. The production of pig-iron is rather reduced, but not to the extent that might have been expected, as the furnaces kept in operation include the largest and the most productive. The production of ironstone is, however, considerably lessened, partly by the closing of mines and partly by the working of short time. In Cumberland there are many furnaces still unlit from Whitehaven to Maryport; but there is a feeling that the lowest limit has been reached, and the intention to extend works at the latter town proves conclusively the opinion which capitalists have formed of the future of the trade. At Barrow the steel mills are actively employed, and the producing capacity is at the present time taxed to the utmost. The distance from the source of the fuel supplies counterbalances some of the advantages given to the North-Western district by its possession of the largest supplies of red hematite ores in Britain, for the coke procured from South Durham is considerably increased in price before it reaches the Barrow district; but the purity and the richness of the ore and the unmistakable manner in which its use for steel is advancing prove more than a counteracting influence. It must be observed, however, that if the efforts to adapt the ores of Cleveland to steel-making purposes should succeed there would be a revolution in the conditions under which the competition between the various iron-producing districts of Britain is at present carried on. Cleveland is already entering into the steel trade. It imports Spanish and other similar ores, and, smelting these with some admixture, its contiguity to the coal fields in some degree enables it to meet the cost of the freight of the ores from Spain. But it is possible that Cleveland may yet be able to produce from its own unlimited mineral treasures the metal of the future. The iron produced in these two districts—the North-East and the North-West—amounts to nearly one-half of the total quantity produced in Great Britain, and the circumstances of the trade at present point to the probability that

there will be a further development there, at any rate so far as the production of crude metal is concerned. The iron trade is, however, fruitful in changes; and with the possibilities in regard to the manufacture of steel from cheaper ores yet unsettled, it is difficult to decide as to the future of the growing competition between the North-East and the North-West.

#### FOREIGN MINING AND METALLURGY.

The weather has thus far continued unusually mild in Belgium—a circumstance which has, perhaps, been of some benefit to Belgian coal consumers, but which has not been viewed with equal satisfaction by Belgian coal producers. Rather a better current of orders has been noticed in the Belgian iron trade, and this circumstance has exerted a direct and immediate influence on the Belgian coal trade, but not to a sufficiently marked extent to produce a serious advance in prices, which, upon the whole, have continued very low. A conference of proprietors of mines and delegates from the Ministry of Ways and Communications has just taken place in Russia; there were also delegates present from the Ministries of the Imperial Crown lands and the Marine. It appeared to be the general feeling at the Congress that after the inauguration of the Donetz line a rapid development of coal mining industry may be anticipated in Russia, and that it will be necessary in consequence to increase the supply of rolling stock upon some of the principal Russian railways. Closed trucks were declared to be the best adapted for the conveyance of coal. The supply of rolling stock on the Azow Railway was reported to be insufficient; an early addition of 20 locomotives and upwards of 500 trucks was stated to be imperatively required. Belgian industrialists are hoping to obtain orders for some of the additional rolling stock referred to as indispensable at this Russian Congress. The Consul of Belgium at Lucca has officially expressed his opinion that an advantageous market might be found for Belgian coal in Tuscany; the customs duty imposed on foreign coal entering Tuscany is 104. per ton.

The week has been rather an indifferent one for the French coal trade. The improvement or animation noticed a week since has subsided, and hopes which had been excited as to the future have been succeeded by apprehensions. Rather unusually fine autumn weather has had something to do with the change in the situation. There is nothing of special character to report with reference to the various markets. The attention of French industrialists has been a good deal occupied with the treaties of commerce question—in other words, industrialists are endeavouring to prevent their renewal in their present shape. In the Nord, for instance, great efforts are being made to prevent a reduction of the existing tariff on coal. On the other hand, M. Isaac Perreire has published a brochure, in which he shows that it would be highly advantageous to French interests to have coal available for consumption at a cheap rate.

The position of the Belgian iron trade is considered to be becoming better, not only on account of the numerous enquiries as to prices which reach the Belgian works, but also on account of the real actual orders which are given to them. Orders have to be executed at once, or at any rate within a very brief period; it is only on this condition that work can be obtained. Prices begin to be discussed by certain firms, but not very seriously, as the future is not considered to be very well assured. The Angleur Steelworks are refusing any further orders for the present, their production being all engaged until July, 1878. These works have just secured a contract for 18 miles of steel rails; in connection with the competition for this contract it may be observed that the lowest tender came from Germany, but it was declared irregular, and null and void. It is understood that the Russian Government is endeavouring to negotiate at present the purchase of 130 locomotives and 1750 goods trucks, closed and open; deliveries are to be made before May 1, 1878. The totals just given do not include certain engines and trucks either just delivered or in course of construction. All that Belgian mechanical establishments can undertake to deliver before May 1 is 50 locomotives and 1200 trucks. The question of the establishment of iron-supported railways has made a fresh step in advance this week. Thus a new station just inaugurated at Pesh covers only railways resting on iron upon the system of Messrs. Serres and Battig. In connection with this Pesh station, it may be noted that some of the ironwork was furnished by the Marais Forges, Foundries, and Rolling-Mills Company, at Montigny-Sambre. An important contract for rails—12,000 tons for the Rowan Railway—is in course of negotiation in Italy; English as well as Belgian works are endeavouring to obtain this contract. A provisional contract concluded between the Hungarian Government and the John Cockerill Company for the leasing of the slate forges at Dierzy has just been broken off. The Bochum Works have contracted to supply about 6000 tons of steel rails to the Saragossa and Pampluna Railway; the terms upon which this contract has been obtained are, however, very low—7. 7s. 6d. per ton.

The French iron trade continues quiet. The unsettled aspect of French politics prevents the conclusion of some contracts, and the advance of the season prevents the conclusion of others, so that very little has been passing, and even the orders obtained are not heavy. However, business may be said to be moving on without much change in prices. The quantity of iron which has entered Paris in the first nine months of this year has been 27,853 tons in excess of the corresponding movement for the corresponding period of 1876. This result was, however, largely attributable to the works of the Universal Exhibition buildings, 1875, which are now almost entirely completed. In the basin of the Loire and the Centre some small orders have maintained work and supported prices. In the Meurthe-et-Moselle refining pig is much neglected; it has been quoted of late at 2. 10s. to 2. 10s. 6d. per ton. The Luxembourg district has disposed of its large stock of pig in Germany, and the situation is relieved to some extent in consequence.

The Hungarian iron trade is described as being in a very critical state. It is suggested that the Government should arrange so that ample credit for the development of the industry should be granted to the ironmasters by the new bank, on security of the woods, works, and mines, on which at present no advances can be obtained. The reduction of the railway tariffs for fuel and for the carriage of the manufactured articles, so that the costs of productions might be reduced, and the area of consumption be extended, are also demanded.

A report from Charleroi says that most of the Belgian ironworks are sufficiently supplied with orders to keep them going until the end of the quiet season. Certain firms are negotiating for very large foreign contracts. Some large orders for iron plates have been received from Russia, and some of the rolling machines which were stopped have been again started. The coal trade is not so active as usual at this season.

**THE IRON TRADE.**—(Griffiths's Weekly Report).—Friday Evening. A moderate business was done in warrants on the Glasgow Exchange this morning at 52s., which was the closing quotation this afternoon. There is, therefore, no change in prices since last week. We quote makers' No. 1 iron:—Gartsherrie, 59s. 6d.; Coltness, 59s.; Calder, 61s. 6d.; Langloan, 62s. 6d.; Summerlee, 59s. 6d.; Monkland, 54s. f.o.b. Glasgow; Glasgow, 59s. 6d.; Eglinton, 54s. 6d. f.o.b. Ardrossan; Shotts, 61s. 6d. f.o.b. Leith; Kennel, 58s. f.o.b. Bo'ness. The month of November, up to the beginning of this week, has been a very quiet month for business on the iron Exchange here. It was the general impression that November would be a very quiet time for the iron trade. This week the market looks better; let us now hope that the worst is past. Good Welsh bars are in better demand, and for Llyn and other brands of good standing, the makers would exact 2s. 6d. more from buyers. Staffordshire iron of good Staffordshire quality is in slightly improved request; prices of this kind are firmer. Orders for Staffordshire marked bars have been given out more freely this week, probably the merchants think that it is wise to wait no longer; we are certainly of this opinion. Sheet iron of Staffordshire make continues in moderate request. The makers are all supplied with orders to keep the works running full time. The demand for nail rods for shipment is steady at the present low prices. A considerable order was given out this week by an eminent builder in London for constructing iron, which was taken by Alexander Sohier and Co., of Monceau-Sambre, Belgium.

We have no contracts to report in iron or steel rails this week. Our market continues depressed in the former class. The manufacturers of plates in the Middlesbrough districts still want orders, and ship-plates, although at a low figure in this district, are not in sufficient request to keep the mills going. Pig-iron in Middlesbrough is quoted is, higher than last week. Scotch pigs, both in London and on the Glasgow Exchange, closed to-day (Friday) about the same as last week. There is a little more doing in wire rods and boiler plates, the very best brands—say, Snedhill, B. T. Wright and Sons, and W. Millington and Co., of Summerhill, are more enquired for. One or two fair specifications for these brands have been placed this week. The general market for pig-iron for melting purposes at the foundries and forge iron is no worse than it was last week, but a

little firmer. John Bagnall and Sons have appointed the well-known old firm of Bailey Toms and Co., of Laurence Pountney Hill, in this city, their export agents for all the foreign markets where Bagnall's iron is so well known.

**Messrs. BROOKER, DORE, and CO.—IRON.**—Subsequently to the issue of the October report the market for Scotch pigs became still further depressed. We were disposed of in the early part of last week at as low a figure as 52s. 3d. On Wednesday, however, the market improved, and closes to-day at 52s. 3d. There are now only 88 furnaces in blast, being 29 less than at this time last year. The Middlesbrough market was firmer to-day, and some makers were asking 1s. additional with those of last month. We notice that the Board of Trade returns continue to furnish reason for hoping that agencies are at work which will eventually bring back prosperity to the trade. The shipments for October, as compared with those of the same month in 1876, show not only an increase in quantity of not, however, be attached to these figures, as it is to be feared that in times like the present returns are swollen by the consignments of makers and speculators, who resort to this means of forcing sales and raising money. Making all allowances, however, for illegitimate trading, it is evident that a sound demand is set-ling in.—Baldwin's Iron: The importation reduction made in prices last month is set-ling the effect of stimulating demand for this best class of sheet iron, and Messrs. E. P. and W. Baldwin report that their order-book is full to the end of the year.

**ALMADA and TIRITO SILVER MINING COMPANY.**—It will be seen by this day's Journal that the directors have received a telegram from Mr. Breach announcing the cutting of the Tiritio lode south of the south slide. This discovery is likely to be very important, as the ground south of this slide is quite unexplored from the surface to the 54 below tunnel, a depth in all of 100 fms. and upwards. Should good ore be found it can be opened up quickly and cheaply from the different levels driven from the Tiritio shaft, the lowest level being 54 fms. below tunnel.

**VIRNEBERG.**—The development of this mine continues to progress satisfactorily, and important additions are being made to the already large reserves. The report we publish this week announces the opening up of a good course of copper ore in the 85 lachter level; since its discovery about three months ago a considerable distance has been driven on it north and south, and from the latter divergence level is also improving, and it seems probable that the course of copper ore driven through in the 100 (valued there at 80s. per lachter) will soon be met with in the bottom level; this must greatly enhance the value of the mine. A good pile of ore is already dressed, and is constantly increasing. The erection of the engines, dressing and other machinery is being vigorously pushed on, and the necessary preparations underground for raising large and regular supplies of ore are proceeding. In this mine the shareholders evidently appear to possess a remarkably fine property, and investors will, no doubt, be attracted by its progressive improvement.

**LEAD MINING IN NORTH DEVON.**—This industry is likely to improve in the next few months. In the Combarnet district some good lodes of silver-lead have been cut recently, and the specimens of ore which have been exhibited in Barnstaple are very fine. The North Devon lead mines appear to be well managed, and we should not be surprised to hear that one or more of the lead mines there go into the Dividend List before long.

LEAD ORES.				
Date.	Mines.	Tons.	Price per ton.	Purchasers.
Nov. 16—	Minera	70	£12 4 6	Walker, Parker, & Co.
— ditto		63	12 1 0	ditto
— ditto		60	12 1 0	ditto
— ditto		15	11 5 6	Mill Dam Smelting Co.
— ditto		31	12 4 6	St. Helen's Smelting Co.
— ditto		7	12 3 6	Walker, Parker, & Co.
—	Hornachos	19 14 1	31 2 1	Nevill, Druce, and Co.
19—	Pandora	60	11 11 6	Jenkin Brothers.
22—	Roman Gravel	50	12 11 0	Nevill, Druce, and Co.
—	ditto	50	12 8 0	ditto
—	ditto	50	12 6 6	George Burr.
—	ditto	30	12 5 0	ditto

Date.	Mines.	B L E N D E R.		Purchasers.
Nov. 16—	Minera	Tons.	Price per ton.	
— ditto	89	£	4 12 0	Kenrick and Son.
— ditto	27		4 3 0	ditto
— ditto	14		4 0 6	Vivian and Sons.
— ditto	14		4 0 6	Villiers Spelter Co.
— ditto	33		4 15 6	ditto
— ditto	22		3 19 6	ditto
20—Cwmbyr	20		4 7 0	Vivian and Sons.

Date.	Tons.	Price per ton.	Purchasers.
Nov. 21	5½	£37 0 0	J. S. Trengoning and Son.
— ditto	3½	31 2 6	T. Bolitho and Sons.
— ditto	3½	31 2 6	Calenick Smelting Co.
— ditto	5	29 7 6	J. S. Trengoning and Son.
— ditto	3	34 12 6	ditto
— ditto	4½	25 15 0	Redruth Tin Smelting Co.

#### COPPER ORES.

Sampled Nov. 7, and sold at the Royal Hotel, Truro, Nov. 22.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Devon Great Consols.	97	£1 19 0	South Caradon	48	4 6 6
— ditto	97	1 2 6	— ditto	42	4 12 6
— ditto	78	1 3 6	— ditto	41	10 3 6
— ditto	77	1 4 6	— ditto	39	10 1 6
— ditto	78	1 3 6	Marke Valley	91	3 3 6
— ditto	74	1 3 6	— ditto	77	5 9 6
— ditto	72	4 13 6	— ditto	70	2 12 6
— ditto	68	1 4 0	— ditto	69	2 2 6
— ditto	67	3 18 6	— ditto	48	2 1 6
— ditto	64	1 5 6	— ditto	34	3 6 6
— ditto	63	1 7 6	— ditto	51	4 1 6
— ditto	50	4 12 0	Gunnislake (Clitters)	80	4 2 6
— ditto	43	1 6 6	— ditto	78	4 2 6
— ditto	5	18 15 6	— ditto	78	4 2 6
South Caradon	94	2 10 6	Glasgow Caradon	69	3 4 6
— ditto	85	2 16 6	— ditto	67	4 4 6
— ditto	78	4 16 0	— ditto	59	3 15 6
— ditto	76	5 5 6	Hington Down	73	2 5 6
— ditto	74	4 12 6	— ditto	33	1 19 6
— ditto	71	6 6 6	— ditto	33	1 19 6
— ditto	64	3 3 6	Bedford United	90	5 2 6
— ditto	60	3 3 6	East Caradon	50	4 2 6
— ditto	59	5 4 6	Wheal Russell	38	3 2 6
— ditto	56	2 17 6	Botallack	35	2 4 6
— ditto	53	10 5 6			

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Devon Great Con.	986	£2240 6 0	Hington Down	103	£386 10 0		
South Caradon	940	4946 10 6	Bedford United	90	272 5 0		
Marke Valley	420	1438 0 6	East Caradon	59	295 0 0		
Gunnislake (Clitters)	332	1523 17 0	Wheal Russell	38	79 4 0		
Glasgow Caradon	195	735 10 0	Botallack	35	214 7 0		

Average standard	£ 57 14 0	Average produce	£ 218 0
Average price per ton	3240	Quantity of fine copper	236 tons 8 cwt.
Quantity of ore	£12,021 13 6		

#### COPPER ORES.

Sampled Nov. 7, and sold at Swansea, Nov. 20.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Betta Cove Ore	124	10½	£8 1 6	Cavera Ore	85	6½	£3 14 6
— ditto	124	10½	6 1 6	— ditto	84	6½	3 12 6
— ditto	124	10½	6 1 6	Aljustrel	68	4½	2 9 6
— ditto	124	10½	6 0 0	— ditto	68	4½	2 9 6
— ditto	110	6½	3 1 6	— ditto	67	4½	2 9 6
— ditto	110	6½	3 1 6	Union Ore	120	5½	4 1 6
— ditto	110	6½	3 1 6	— ditto	76	7½	1 12 6
— ditto	91	6½	3 1 6	Copper Reg.	43	11½	7 12 6
— ditto	91	6½	3 2 6	Constantine	69	23	13 16 6
Cavera Ore	88	6½	3 14 6	— ditto	9	18½	9 16 6
— ditto	87	6½	3 14 6	Algerian	9	18½	9 16 6
— ditto	87	6½	3 16 0	Copper Precip.	6	60	38 6 6
— ditto	85	6½	3 12 6				

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Betta Cove Ore	1008	£4580 2 0	Constantine Ore	69	£493 10 0		
Cavera Ore	614	1903 2 6	Copper Regulus	9	234 4 0		
Aljustrel Ore	203	497 6 6	Algerian Ore	9	217 10 0		
Union Ore	120	336 0 0	Copper Precipit.	6	60 0 0		
Copper Ore	119	401 0 0					

Names.	Tons.	Amount.
Copper Miners' Company	222	£ 491 4 6
P. Grenfell and Sons	417	1865 0 0
Nevill, Druce, and Co.	376	1370 9 0
Vivian and Sons	401½	1692 16 0
Williams, Foster, and Co.	191½	844 15 0
Mason and Ekington	93½	368 0 0
Charles Lambert and Co.	22½	69 19 0
Sweetland and Co.		48,632 0 6

Total	31 cwt.	Produce.	Price.	Per unit.	Standard.
Whole sale	2059	£ 4 3 10	11s. 1d.	£53 4 6	



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0000	Dubby Syke, <i>i</i> , Durham	0 12 6.	¾	¾ ¾
144	East Cardon, <i>c</i> , St. Cleer	2 16 0.	1½	1½ 1½
0000	East Chagren, <i>c</i> , Perranrabbol	6 17 0.	3	2½ 3
0000	East Craven Moor, <i>i</i> , Pateley Edge	10 0 0.	10½	10 10½
0000	East Goginan, <i>i</i> , Cardigan	2 0 0.	—	—
0000	East Van, <i>i</i> , Llanidloes	8 0 0.	4	4½ 4½
722	East W. Howell, <i>i</i> , Helston	8 11 0.	1½	1 1½
000	Elgar, <i>s</i> , <i>i</i> , Cardiganshire	1 0 0.	1½	1 1½
000	Fronzevan, <i>i</i> , Mont. [4000 sh. fy. pd.]	1 0 0.	—	—
050	Gawton, <i>c</i> , Tavistock	4 5 8.	¾	¾ ¾
0000	Glan Clwyd, <i>s</i> , <i>i</i> , Gwydelwern	1 0 0.	—	—
0000	Glenrhy, <i>s</i> , <i>c</i> , Isle of Man	4 5 0.	1	¾ 1
0000	Glyn, <i>s</i> , <i>i</i> , Llanidloes	2 0 0.	¾	¾ ¾
0000	Goginan, & Llewellyn, Newydd, Card, <i>i</i>	2 10 0.	—	—
0000	Gold, <i>c</i> , Merionethshire	1 0 0.	—	—
0000	Goreu, <i>s</i> , <i>c</i> , Carnarvon	1 0 0.	—	—
000	Gt. E. Foxdale, <i>i</i> , I. of Man (11. sh)	1 0 0.	1½	1½ 1½
000	Great Holway, <i>s</i> , <i>i</i> , Flintshire	0 18 0.	—	—
000	Great Pant-y-Pydwel, <i>i</i> , Holywell	2 0 0.	5½	5 5½
000	Gt. Winal Eleanor, <i>s</i> , North Borey.	1 0 0.	—	—
000	Grosvenor, <i>i</i> , Holywell (21 sh.)	0 15 0.	—	—
000	Harehope Gill, <i>s</i> , <i>i</i> , Durham (21 sh.)	0 5 0.	—	—
000	Harwood, <i>s</i> , <i>i</i> , Durham	0 15 0.	1	1
000	Hush Elsteddoff Miners, <i>s</i> , <i>i</i>	2 0 0.	—	—
000	Ialay, <i>s</i> , <i>i</i> , Scotland	28 0 0.	—	—
000	Killalee, <i>s</i> , <i>i</i> , Tipperary	1 0 0.	—	—
000	Killifreth, <i>s</i> , Chacewater	2 1 0.	¾	¾ ¾
000	Kingston Con, <i>s</i> , Stoke Climsland.	1 0 0.	—	—
000	Ditto, preference	1 0 0.	¾	¾ ¾
000	Ladywell, <i>s</i> , <i>i</i> , Salop.	2 10 0.	1½	1½ 1½
000	Ditto, 10. <i>s</i> , <i>i</i> , Salop. pref., 11. each	0 10 0.	¾	¾ ¾
000	Levant, <i>c</i> , <i>s</i> , <i>i</i> , St. Aust.	0 10 0.	¾	¾ ¾

Shares.  
\$100.00

IRON AND COAL COMPANIES  
Company.

	Paid.	Fried.
18 Abbot, John, and Co. [L.]	275	0 0 0
10 Allison Steel and Wire Co. [L.]	14	0 0 0
10 Altimati Colliery Co. [L.]	8	0 0 0
100 Ashbury Co. [L.]	5	0 0 0
10 Bail, John, and Sons [L.]	90	0 0 0
10 Benhar Coal Co. [L.]	10	0 0 0
60 Bilbao Iron Ore Co. [L.]	5	0 0 0
10 Bilson & Crumach Co. [L.]	5	0 0 0
4 Bienen Cramach Coal Col. Co. [L.]	10	0 0 0
60 Bienenavon Iron and Steel Co. [L.]	4	0 0 0
100 Bolekow, Vaughan, and Co. [L.]	80	0 0 0
60 Bowling Iron Co. [L.]	50	0 0 0
60 Britannia Ironworks [L.]	50	0 0 0
60 Brown, Bailey, and Dixon [L.]	25	0 0 0
100 Brown, John, and Co. [L.]	40	0 0 0
6 Cakenmore Colliery Co. [L.]	5	0 0 0
100 Cammell and Co. [L.]	5	0 0 0
20 Cannonk and Hastings Coal [L.]	80	0 0 0
10 Cardiff & Swansea St. Coal Co. [L.]	6	0 0 0
10 Cardigan Steel and Wire Co. [L.]	9	0 0 0
10 Central Swedish Iron and Steel [L.]	8	10 0 0
6 Chapel House Colliery	10	0 0 0
60 Charlter Iron Co. [L.]	5	0 0 0
60 Charterley Iron Co. [L.]	50	0 0 0
10 Chiffington Iron Co. [L.]	45	0 0 0
10 Cies Hill Colliery Co. [L.]	10	0 0 0
100 Consett Iron Co. [L.]	10	0 0 0
1 Consett Spanish Ore [L.]	7	10 0 0
1 Cooke, William, and Co. [L.]	1	0 0 0
20 Darlington Iron Co. [L.]	40	0 0 0
60 Davy Brothers [L.]	12	10 0 0
5 Diamond Fuel Co. [L.]	22	10 0 0
20 Ebbw Vale Co. [L.]	5	0 0 0
100 Fox, Samuel, and Co. [L.]	29	0 0 0
10 General Mining Ass. [L.] (2 returned)	80	0 0 0
20 Gwynn Western Coal Co. [L.]	17	0 0 0
2 Gwynn Hill Colliery Co. [L.]	2	0 0 0
6 Knowles, Andrew, and Co. [L.]	11	0 0 0
10 Llay Hall Coal, Iron, & Firebrick [L.]	17	0 0 0
6 Littleddan Woodsale Coal Co. [L.]	10	0 0 0
60 Llynvi, Ogmore, & Tondy Co. [L.]	8	0 0 0
60 Lydney and Wiggpool Iron Ore [L.]	60	0 0 0
60 Marlballa Iron Ore Co. [L.]	8	0 0 0
60 Marsteel Steel and Iron Co. [L.]	10	0 0 0
60 Midland Iron Co. [L.]	8	0 0 0
6 Mold & Gwydyr Colliery Co. [L.]	5	0 0 0
10 Monkland Iron and Coal Co. [L.]	10	0 0 0
60 Mwyndy Iron Ore Co. [L.]	3	10 0 0
10 Nant-y-Glo and Blaiddis (S. p. c. pref.)	100	0 0 0
3 Nerbudda Coal and Iron [L. & Red.]	2	0 0 0
10 New Shariston Collieries [L. & Red.]	20	0 0 0
10 New Port Abercrom Coal Co. [L.]	10	0 0 0
10 Northampton Coal, Iron & Wagon [L.]	4	0 0 0
1 Northfield Iron Co. [L.]	4	0 0 0
1 Norton Green Coal Co. [L.]	8	0 0 0
35 Palmer's Shipbuilding and Iron [L.]	25	0 0 0
20 Patent Nant-y-Glo & Co. [L.]	85	0 0 0
20 Patent Shaft and Axletree [L.]	14	0 0 0
60 Peisall Coal and Iron, & Co. [L.]	18	0 0 0
10 Phoenix Bessemer Co. [L.]	40	0 0 0
10 Rhymney Iron Co. [L.]	60	0 0 0
0 Richards and Co. [L.]	10	0 0 0
0 Sandwell Park Colliery Co. [L.]	100	0 0 0
0 Ditto New	10	0 0 0
0 Shotts Iron Co. [L.]	10	0 0 0
0 Sheepbridge Iron and Coal [L.]	80	0 0 0

## WAGON COMPANIES.

TELEGRAPH COMPANIES

82. Anglo-American .....	100	0 0.
10 Brazilian Submarine .....	10	0 0.
30 United States Cab'l .....	10	0 0.
10 Eastern .....	10	0 0.
10 East. Exten., Australia and China..	10	0 0.
10 Great Northern .....	10	0 0.
Indo-European .....	25	0 0.
5 Mediterranean Extension .....	10	0 0.
8 Reuters .....	8	0 0.
Stk. Submarine .....	100	0 0.
10 West India .....	10	0 0.
20 Western and Brazilian .....	20	0 0.
\$1000 Western Union, 7 per cent .....	200	0 0.

## MISCELLANEOUS

Stk.	Atlantic and Great Western Leased Lines, Rental Trust	100	0 00
25	Australian Agricultural	21	10 00
10	Aust. Mort. Land and Finance [L.]	8	0 00
10	Average Engine [L.]	7	0 00
Stk.	Baltimore & O. Ry. Co. 7 per cent.	100	0 00
10	Brighton Aquarium [L.]	100	0 00
Stk.	Cent. of New Jersey Con. Mort.	100	0 00
Stk.	Cent. Pacific of Calif., 1st Mort. 6 p.c.	100	0 00
25	City of London Real Property [L.]	12	0 00
25	Copper Miners of Eng. (7 p. c. pref.)	25	0 00
15	English and Rock Boring	4	10 00
16	Fore Street Warehouse Credit	8	0 00
15	Foster, Porter, and Co. [L.]	14	0 00
5	Gen. Phos. & Chem. Works Co. [L.]	5	0 00
1	Greenhill [L.]	1	0 00
5	Kit Hill Tunnel [L.]	1	0 00
17	Hudson's Bay Company	17	0 00
Stk.	Illinois Central Copper and Sul. Co. ...	9	0 00
Stk.	Illinois & St. Louis Ry. Mort.	100	0 00
Stk.	Iditto, 2nd Mort., 7 per cent.	100	0 00
Stk.	Illinois Cent. Sinking Fund, 5 p. cent.	100	0 00
Stk.	Iditto, 6 per cent.	100	0 00
75	Imperial Credit [L.]	7	10 00
Stk.	Lehigh Valley Co. Surplus Certificate	—	—
10	Miner's Safe [L.] Mort., A, 6 p. cent.	100	0 00
25	National Discount [L.]	10	0 00
Stk.	N. Cent. Rail. Con. Mort., 6 per cent.	10	0 00
10	Pawson and Co. [L.]	6	0 00
50	Pennsular and Oriental Steam	50	0 00
Stk.	Pennyl. Gen. Mort. 6 p. cent., 1910.	100	0 00
10	Penns. Sinking Fund, 5 p. c., 1905	100	0 00
Stk.	Scottish Aust. L. & C. Company.	100	0 00
Stk.	Iditto, 6 per cent. Preference	100	0 00
10	Silver Light (ord. sh.)	10	0 00
20	Suez Canal shares	20	0 00
12	Telegraph Construc. & Maintn. [L.]	12	0 00
10	Iditto, Second Bonus Three per Cents	5	0 00
Stk.	Union Pacific and Copper Co.	10	0 00
Stk.	Union Pacific Ry. Mort., 1st Mort.	100	0 00
Stk.	Union Pacific Railway Co.	100	0 00

blende; c, coal; c, copper; g, gold; l, lead; s, silver; sl, slate;  
sl, silver lead; t, tin; z, zinc.  
Limited Liability Companies; † quoted on the Stock Exchange;  
‡ have paid dividends.

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